COAL AGE

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The Days of Reconstruction

BY FLOYD W. PARSONS

NOTHING can change the fact that war is a school where the tuition costs more than the learning is worth. However, the present conflict on our part was unavoidable, and we have been compelled to meet the situation with all the force we could muster.

When peace comes this Nation, like all the other great countries, will have to start paying off a debt that is so colossal it is beyond the average understanding. Victory, and a dictated peace, will mean the end of the horrors of killing men, but it will also mean the commencement of our struggle to pay the bill for our battles for liberty.

The money expended by the seven leading belligerents for purely war purposes up to the present time amounts to more than $141,000,000,000. The combined average war cost is now $4,500,000 each hour of the day. The total net war debt of the principal nations engaged in fighting is $132,000,000,000.

Let us not deceive ourselves concerning the years following the war. There will be industrial activity in certain lines, for we must gradually reclaim wasted areas and readjust our lives. But the wholesale destruction of life and property is not the precursor of prosperity. The task of healing the wounds that civilization has received will necessitate our enduring further sacrifices and continuing the maximum observance of our newly created conservation and efficiency measures. In other words, our future success will depend largely on our ability to avoid a relapse into the wasteful and careless industrial habits of our pre-war days.

Here and there among all our trials and sorrows are a few bright spots. Chief of such benefits is our better knowledge of standardization. The need for greater production at a time of labor shortage has forced our leaders to seek shortcuts, adopt new methods and substitute machines for men. Economy and efficiency are the watchwords of the day.

We have learned that standardization is something more than the pet hobby of efficiency experts. The doctor cannot make a correct physical diagnosis unless he compares his readings of the individual with the standard or normal respiration, heart beat and body temperature. Measurement is the soul of standardization; through it we determine the degree of quality and the rate of performance.

No longer do we believe that standardization means fixity of progress. Like the bark of a tree, it may bound progress but must not limit growth. Inflexible standards retard development. True standardization is the consensus of the best that an industry affords and always keeps step with the advances of that industry. At least we have come to know that the elimination of chance in our national effort has ushered in a new and better era.

What I am trying to get across to the reader is a broad general thought that should be discussed and developed in *Coal Age*. We have as an important principle of standardization the "interchangeability of parts," and there are other subjects equally vital to the big problem.

I want to ask coal-mining men in every field who are desirous that our industry shall not lose the ground gained through our present emergency to write us a few thoughts on this important question. We may enter the after-the-war period of reconstruction sooner than we anticipate, and no problem is of greater importance than the national standardization of coal mining.

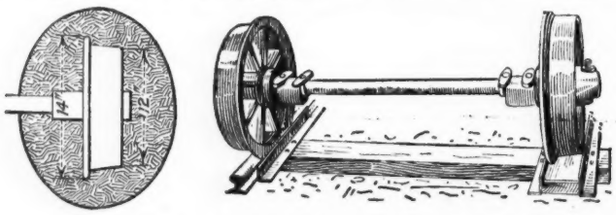
Do your part to help develop plans that are both practical and constructive, and let us hear from you today.

IDEAS AND SUGGESTIONS

Suggestion for a Sharp Curve

BY MATTHEW STAFFORD
Chase River P. O., Vancouver Island, B. C.

Sometimes a mine manager or foreman is crippled for lack of room for a proper curve either at the top or bottom of a shaft. I think as a general rule this applies to pit heads and to turning the cars, either when full from the cage or when empty toward it. Especially is this the case where the pit head has had to be changed in certain respects in order to meet a larger



TAKING A CAR AROUND A SHARP CURVE

output. The following suggestion is practical and will help to solve problems incident to the foregoing conditions.

We will assume that the car wheels are 12 in. in diameter and the flange say 1 in. high. This will make a 14 in. diameter measured over the flange. When the car comes onto the curve the outside wheel runs on the rim or flange, which is of greater diameter than the tread. A flat sheet of iron is laid upon a curved wooden rail on either side of which, as well as on the inside of the inner rail, an angle iron is placed. The circumference of the flange on the outer wheel is of course greater than that of the tread on the inner wheel. The outer wheel gains at each revolution approximately 6.28 in. on the inner wheel. This, together with the easy skidding of the flange on the sheet iron, enables the car to be taken readily around a sharp curve.

Straightening Bent Rails

BY W. H. BUTLER
Christopher, Ill.

The straightening of curved rails is sometimes a difficult operation at a coal mine. I have been able, however, in many cases to use a method that requires only a short time to manipulate and accomplishes results that answer all purposes. The tread of practically all locomotive wheels is wider than the ball of the rail upon which it runs. Consequently, to straighten a crooked rail all that is necessary is to place it beside a straight track rail, properly support it with its convex side up and run a heavy locomotive over it once or twice. Of course, at least one end must be so supported that it is free to move endwise, as the span of the rail will be greater when straight than when crooked.

Should the end portions of the rail still be curved the extreme ends may be supported by cap pieces or otherwise and the locomotive again passed over the rail. This method, while it may perhaps seem crude, is nevertheless effective. Furthermore, under ordinary circumstances it is several times as rapid as straightening a bent rail with a jack or rail bender.

Portable Lighting Set

BY FRANK HUSKINSON
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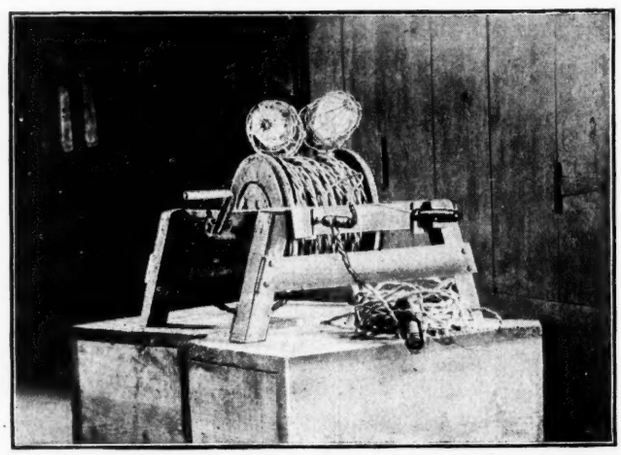
Many jobs around the mine, such as repairing machinery or putting timbers in place, can be handled more conveniently with the aid of electric lights than by the employment of other means of illumination. This is particularly true if the repair job is located in the aircourse or some other part of the mine where the movement of air is strong.

After experiencing all the inconveniences incident to the use of open lights and electric cap lamps in repairing machinery underground, I devised the portable electric lighting set shown in the accompanying illustration. This set consists of a spool or reel of suitable size on each end of which is fastened a circular brass plate to which the wires wound upon the spool are connected through the spool axle. The spool is hung within a suitable frame and provided with a winding crank, as shown. A piece of spring brass is attached to each side of the frame, making contact with the circular brass plates upon the ends of the spool. These brass brushes are connected to the two terminal posts upon the frame.



LIGHTING SET THAT CAN BE CARRIED EASILY

A piece of lamp cord is fitted with plug terminals on one end to fit into the two terminal posts. On the other end this cord is fitted with an attachment plug to screw into a standard lamp socket. There are also provided two hook terminals to be attached to trolley wire or feeder cable and rail.

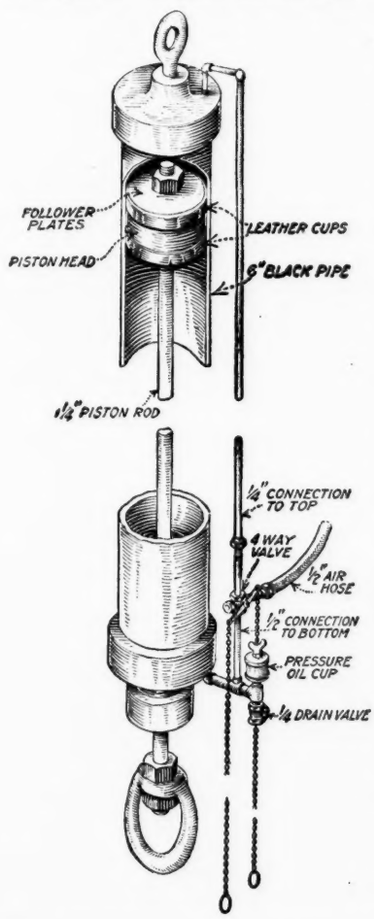
The amount of lamp cord on the reel or spool may vary with local requirements. I have found that from 400 to 500 ft. is ample for most purposes. A few feet

or the entire amount may be unreeled as occasion demands and as many lamps used as are needed.

This device has demonstrated its utility on numerous occasions. Its use is not confined to the mines alone, as it is a valuable contrivance to have in the shops. It is simple, inexpensive and easily constructed. It may be built by almost anyone and sufficient use for it exists to warrant almost every mine possessing one.

Homemade Air Hoist

The accompanying illustration shows an air hoist that can be made at almost any mine shop, where it may be employed to good advantage. Such a hoist may be used either for lifting heavy work into or away from the lathes or other machines, or for overturning cars or similar work. It has the great advantage over a chain block of being much more rapid in action; furthermore, it is far less liable to be taken away from the shop for heavy lifting elsewhere. The drawing is almost self-explanatory. The hoist cylinder, or barrel, is made of a piece of ordinary 6-in. pipe. The piston is constructed of three disks and two cup leathers faced in opposite directions, the whole being held firmly together between a collar on the piston rod and a nut on the end. The admission and release of air is controlled by a suitable cock operated from the floor by means of suitable hand rods. The length of the hoist cylinder and travel of the piston may be made to suit local requirements. One hoist of this kind that has been in successful operation for some time and has proved itself a great time saver is made with a lift of 4 ft. 6 in.

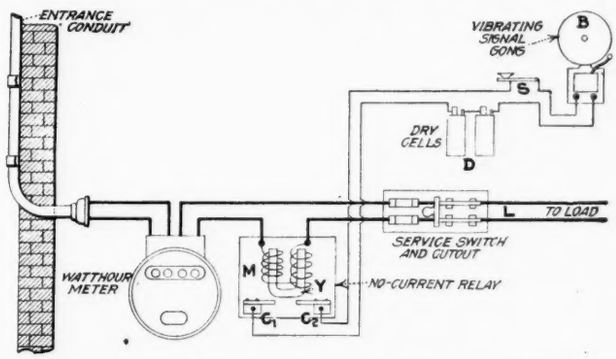


THIS AIR HOIST CAN BE MADE AT ALMOST ANY MINE SHOP

In operation such a hoist as this may be mounted upon a jib crane or a track suspended either permanently from the roof trusses of the building or from a frame in the repair yard, or it may be hung from a chain or eyebolt if horizontal movement is not necessary. Such a device as this may be constructed at small expense, and in many instances, at least, will not only be found highly convenient, but also prove itself a time saver of appreciable value.

Audible Signal to Indicate Discontinuance of Load

The accompanying illustration shows how a signal bell was connected so that it will ring when a group of motors in a distant building is stopped. The relay *M* was made and connected to the supply wires to the load. When the load is taking current through the line *L* the magnet coils of *M* have current in them and pull



METHOD OF CONNECTING AUDIBLE SIGNAL

up the U-shaped yoke *Y*. But when the load is discontinued, *Y* drops down and makes contact across C_1 and C_2. This closes the electric-bell circuit and causes *B* to ring, and it will continue to ring until the switch *S* is opened.

The magnet coils *M* do not require many turns, as all they have to do is to hold up the yoke *Y*. It is not, in most cases, necessary that they be strong enough to pull up *Y*, because it can be raised by hand. The wire used for the magnet coils *M* must, however, be large enough to carry the full load current in the circuit.

Positive Grip for Oil Cans

BY J. A. LUCAS
Ozone Park, N. Y.

It is quite unpleasant to have an oil can slip out of your hand, when standing on top of a ladder. To avoid this, I applied the little device shown in the accompanying illustrations. It is cut out and formed as shown in the pen and ink sketch, and is used on the oil can by tightening it between the oil container and the spout. This device will also prevent the oil can from tilting.

LITTLE DEVICE MAKES AN EFFICIENT GRIP FOR AN OIL CAN

Have YOU bought YOUR Liberty Bond?

Increasing Coal Mine Efficiency—I

By CHARLES E. STUART
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SYNOPSIS — *The first of a series of articles upon the subject of mine efficiency. Many operators and "practical" coal men do not yet realize that the power generation and distribution system of the fair-sized mine offers problems more complicated and intricate than exist in the ordinary town of 25,000 inhabitants.*

Introduction

IN ANY present-day consideration of coal-mine operation having in view increased coal production and operating efficiency, certain war factors must constantly be borne in mind. No study of the subject can be properly made without due allowance for existing war conditions, such as decreasing availability of required machinery; increased delay in obtaining factory repairs or repair parts; increasing load on central stations already frequently overtaxed; and decreasing man power incident to the requirements of the army and as a result of the tempting offers of other classes of war industry.

There is urgent demand for every pound of steel that can be produced. This is needed for the construction of ships, and for the manufacture of shells and other war material. Furthermore, the man with the skill to turn the axle of a mine locomotive can likewise turn an urgently needed shell; in a word, we are short of both skilled labor and raw material for imperative war requirements. Nevertheless, and in spite of these facts as well as because of them, we must increase the production of coal.

FIG. 1. COMPARATIVE ANALYSES SUMMARIZED

This series of articles will not be technical. An operator who regards himself as qualified to purchase a fan motor need not hesitate to study it because of the introduction of curves and other descriptive technical data. The operator capable of specifying and purchasing such a motor will recognize the information as elementary. He will also agree that the facts presented are logical, and they may perhaps recall considerations to which he has at odd times given some casual thought, or difficulties which he has definitely attempted to solve.

The fact that electrical and mechanical engineering skill has become as important a factor in the efficient management of mining properties as civil engineering ability, is today appreciated only by some of the larger and better organized operating companies.

Fig. 1 summarizes the results of a number of comparative analyses. The physical handicaps of the properties have a bearing on the extremes indicated, but these considerations have, relatively speaking, only a small influence. The following report of power consumed and tonnage output is illustrative:

15-Min. Demand, Kw.	Consumption, Kw.-Hr.	Tonnage Output	Kw.-Hr. per Ton
Operation No. 1			
June 518	90,700	35,000	2.7
July 547	101,600	36,400	2.8
Operation No. 2			
June 374	112,100	60,599	1.9
July 412	123,400	60,946	2.0

Mine No. 1 consumes 40 per cent. more power and has 30 per cent. higher power demand. There is some difference in the operating conditions, but nothing that would cause such a wide variation of output to demand as that cited above.

The average town of 25,000 population contains a pumping plant, which takes its water from a single source by a single lift. The municipality contains a well-regulated trolley system. There may be several factories containing more or less complicated systems of electrical drive, and in each and every instance there is maintained a well-organized engineering force headed by a capable electrical or mechanical engineer, or an engineer manager.

The mine with a capacity of 1000 tons a day contains a generating or converting plant, the load upon which corresponds both in diversity and complexity to the combined requirements enumerated in the case of the town of 25,000. The pumping system of the mine is invariably more complicated. If the miner is not properly served by the haulage system, he becomes idle through a greater or less period of time.

The subject of mine ventilation considered in relation to power demand and consumption is in itself an art to which the town offers no parallel. Extremely few factories, for instance, contain motor drives whose needs in the way of skilled attention compare with the requirements of a tipple designed to prepare coal properly for coking and for the market. The lighting requirements of the average mine camp are identical to those of the small town, provided the miners' homes are to receive reasonably good service and the mine itself is to be properly lighted.

In many instances a mine operator does not appreciate the complexity or possible efficiency of his expensive equipment, and is entirely satisfied with an electrician who can keep things going. Frequently, such electricians are capable of serious efficiency work and would gladly undertake it if requested or encouraged to do so and furnished with the necessary assistance. Such an attitude on the mine operator's part is distinctly short-sighted and results in loss of greatly needed coal production, both to the mining company and to the country.

There is another phase of equal importance to the operator from a personal viewpoint—namely, the relationship of investigation and improvement recommended herein to cost and profit. Every recommendation made, if carried out, will save money; or, conversely, will make money for the mine operator. It should be remembered also that no suggestion is made in this series of articles whose value has not been fully demonstrated in practice. These suggestions are not impractical and will only

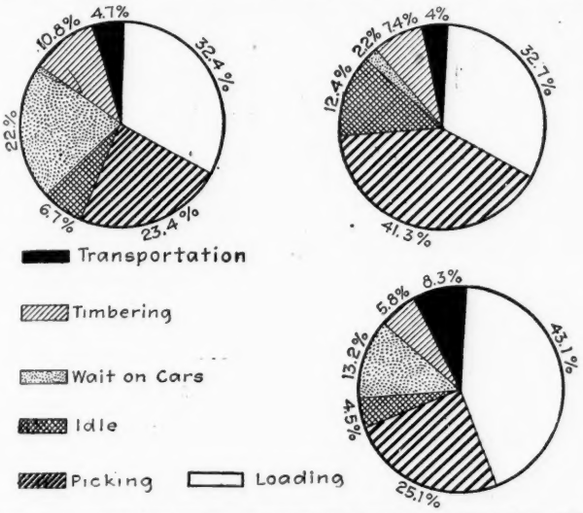


FIG. 2. COMPARATIVE PERFORMANCE OF MINERS IN THREE MINES

appear so to the superintendent or owner who is unable to grasp their significance, or who is unwilling to give the small amount of time necessary to digest the recommendations here made and put forth the subsequent effort that may be requisite in order to carry them out.

To repeat, I am endeavoring to bring to bear a few simple analyses to show that the mine operator with the help at hand is in position to go a great deal farther today than he is now going to meet the demand for conservation in its broad economic sense.

None of the considerations and conditions enumerated in the foregoing should be overlooked in considering the following factors in mine operation, which will be covered in this series of articles: (I) A comparative analysis of a miner's working day. (II) An analysis of the performance of mine locomotives. (III) An analysis of the performance of cutting machines. (IV) The power demand and consumption of mine fans. (V) An analysis of power demand and consumption of mines in relationship to capacity and production. (VI) An analysis of mine power conditions in relationship to production. (VII) A consideration of track conditions in relationship to production. (VIII) The condition of the generating plant. (IX) The relative output of electrified vs. unelectrified mines. (X) Considerations in the case of a shortage of central station capacity. (XI) A coal mine efficiently electrified using purchased power.

I—Comparative Analysis of a Miner's Working Day

Fig. 2 shows the comparative performance of miners in three different mines, two of which are electrified. To arrive at these summaries, a careful analysis was made not only of the actual employment of time by the miner, but also in order to locate and isolate all elements tending to delay him. It is the rule to blame the miner for a small day's production, but we rarely hear of the superintendent or foreman taking unto himself criticism for failure to keep the miner properly supplied with cars.

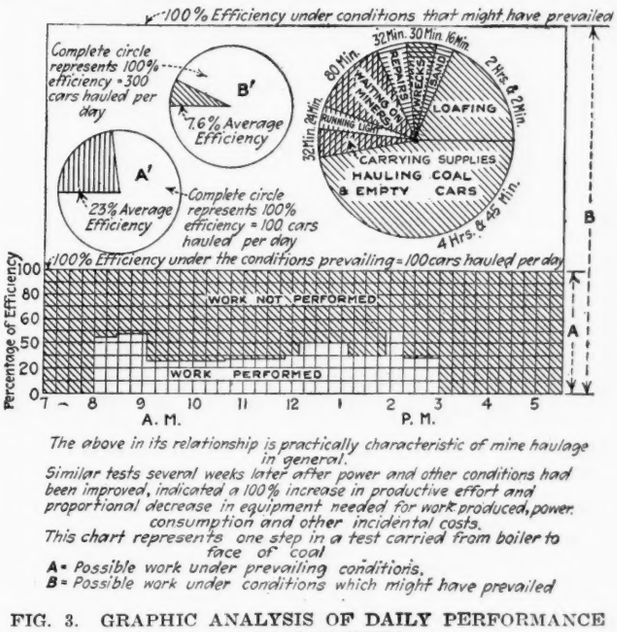
The showing in Fig. 2 is by no means a poor one, or below the average. On the contrary, the group of mines where the observations were made are supposed to be among the most efficiently operated in the country; and

TABLE I. AVERAGE PERFORMANCE OF EQUIPMENT AND MINERS

Hoist:	Minutes	Per Cent.	Gatherers:	Minutes	Per Cent.
Hoisting cars	231	51.2	Hauling	286	49.7
Hoisting supplies	125	22.3	Running light	81	14.1
Waiting for loads	123	22.0	Waiting on loads	89	15.5
Wrecks	60	10.8	Waiting on empties	75	13.0
Idle	21	3.7	Waiting on drivers	...	.....
			Wrecks	28	4.9
Total	560	100.0	Idle	16	2.8
Haulage Motors:					
			Total	575	100.0
Hauling	284	49.3	Miners—Average of 6 Men		
Running light	39	6.8			
Waiting on loads	73	12.6	Loading	217	41.9
Waiting on empties	10	2.0	Picking	141	27.2
Waiting on motors	...	.....	Idle	53	10.2
Wrecks	164	28.2	Waiting on cars	60	11.5
Supplies	6	1.1	Timbering	25	4.8
			Transportation	23	4.4
Total	576	100.0			
			Total	519	100.0

furthermore, their output of coal per miner is a record output. Table I gives several average performances of equipment and miners.

Fig. 4 is a graphic analysis of daily performance showing how the summary in Fig. 2 and the comparative analysis in the table are obtained. We are particularly concerned with those elements of delay which bring about the "wait on cars." Such delays may be classified under the heads of "avoidable" and "unavoidable." Unavoidable delays are those such as occur in any system of transportation. For example, there will be delays incident to transfer of cars from one locomo-



The above in its relationship is practically characteristic of mine haulage in general.
Similar tests several weeks later after power and other conditions had been improved, indicated a 100% increase in productive effort and proportional decrease in equipment needed for work produced, power consumption and other incidental costs.
This chart represents one step in a test carried from boiler to face of coal
A = Possible work under prevailing conditions.
B = Possible work under conditions which might have prevailed

FIG. 3. GRAPHIC ANALYSIS OF DAILY PERFORMANCE OF LOCOMOTIVES

tive to another. Wrecks may occasionally be classified as unavoidable.

In a general way, avoidable delays as here considered are such as are occasioned by a section of the haulage system being congested or inadequate for the work. The chief causes which are responsible for the element of

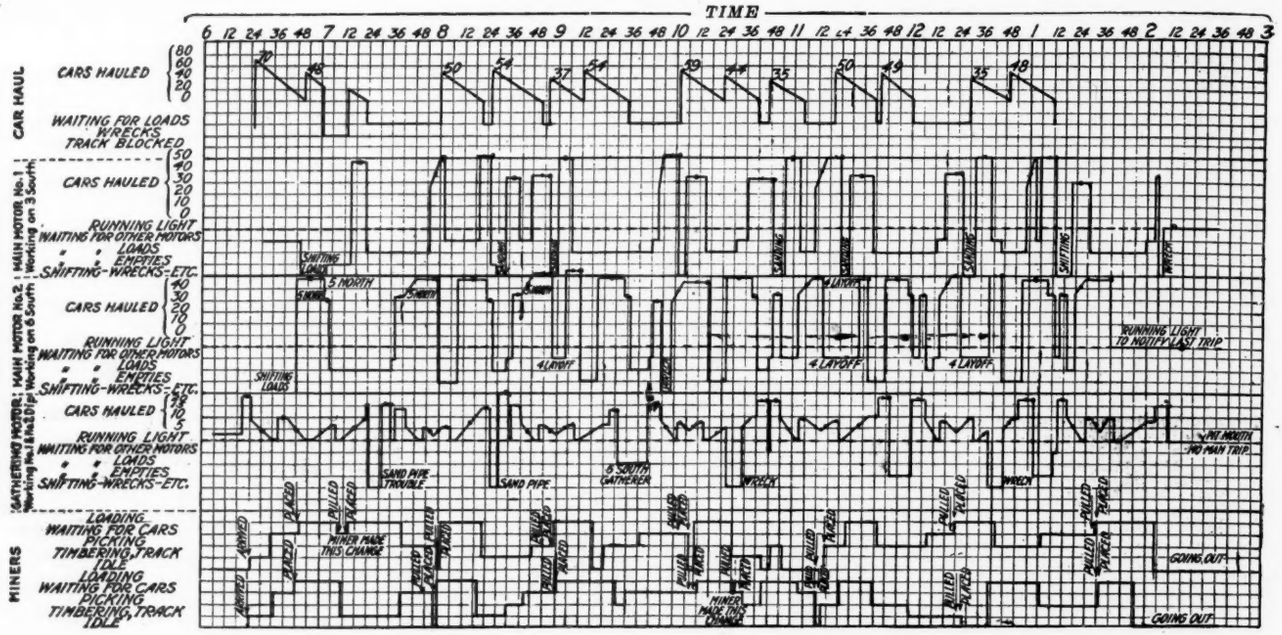


FIG. 4. COMPOSITE RECORD OF PERFORMANCE OF LOCOMOTIVES AND MINERS

time loss shown in Fig. 2, and which may be classified as avoidable, are as follows: (1) Handling supplies; (2) sanding motors at other points than where stops are regularly made; (3) insufficient capacity of loaded and empty partings; (4) poor signal system; (5) insufficient number of cars; (6) wrecks; (7) locomotive trouble due to lack of inspection; (8) delay due to failure to place car ready for miner on his arrival; (9) indifference of motormen; (10) bad management.

II—Analysis of Mine Locomotive Performance

The converse of the analysis of a miner's working time is indicated in Fig. 3. Here we have the composite record of the average performance of a number of gathering locomotives as taken in different mines. Practically speaking, the record is characteristic of mine haulage. One hour and 20 minutes out of the day is shown waiting on miners and 2 hours 2 minutes are spent in idleness or loafing.

I have observed many tests of mine locomotives with the object of developing such comparisons as the foregoing. I have never observed a single test—that is to say, a trial carried through the period of a day—that failed to show serious elements of time lost that could not be classed under the head of avoidable.

The elements of delay derived in Section I are also the basis of time wastage in the locomotive movement. In fact, as is readily appreciated, a delay which would prevent the prompt serving of a miner with cars would similarly as a rule reduce the efficiency of operation of

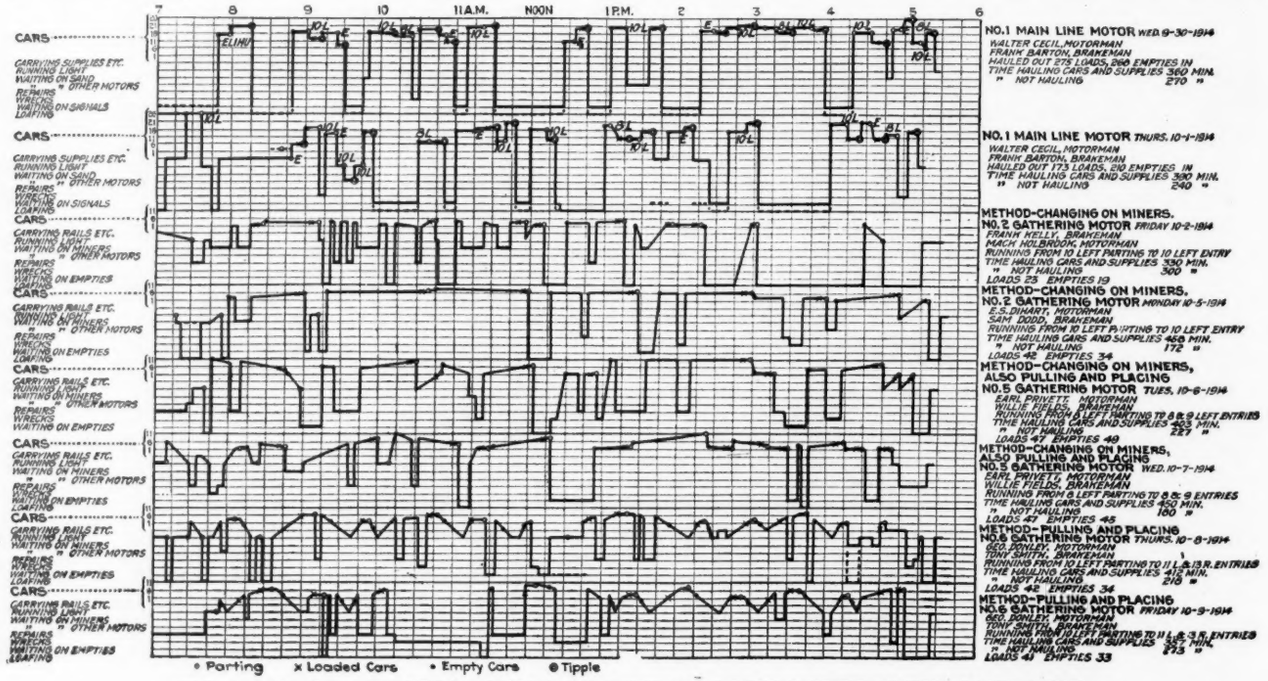


FIG. 5. CHART OF PERFORMANCE OF SEVERAL LOCOMOTIVES IN THE SAME MINE

the haulage system. There is also the factor of management which adjusts the movement of locomotive and cars to the requirements of the miner. Failure to properly make such adjustment will necessitate either the locomotive waiting on the miner or the miner waiting on the locomotive.

Fig. 5 is the chart of one day's work of several locomotives in the same mine. Such a chart can be easily developed for the entire haulage system so as to isolate the elements of avoidable time wastage. If such an analysis is properly prepared for and accurately conducted, it will usually be found that locomotives which were thought necessary can be done without. It will often be discovered that a mine is overequipped from a haulage standpoint. I have observed increases of more than 100 per cent. in productive effort following carefully conducted examinations of this character.

A locomotive is usually regarded as necessarily subject to frequent breakdowns incident to controller trouble, bearing trouble and armature burnouts. When these troubles are too frequent, the manufacturer is blamed. Nevertheless the manufacturers who supply a considerable proportion of mine locomotives in use likewise supply approximately 100 per cent. of street-car motors, which are in nearly all respects similar in design to the mine motor.

A street-car motor is supposed to last about five years before it becomes necessary to rewind it. During that period it is expected to do 200,000 car-miles. Provided a mine motor is of proper capacity for its work, there is no reason why its lasting qualities measured in period of time should not be equal to that of the street-car motor. The mileage, of course, will not compare.

Why Motor Trouble on Street Cars Is Rare

We all know how rare it is for a street car to stop on account of motor trouble. In spite of the number of cars in operation in a great city, a tie-up on account of trouble with a motor is a rare occurrence. The reason is that the rated voltage is supplied at all times and there is daily inspection.

I visited a number of mines in Germany some years ago in order to observe the mine machinery in use. On commenting upon a daily delay sheet that was kept, and the absurdly low repair cost as well as the small amount of time used in effecting repairs, I was advised that this was due to the daily inspection which all machinery underwent. The rule of the railways should be followed and the mine locomotive should be subjected to daily inspection by a competent man. The following parts should be examined with particular care daily: First, controller segments should be filed and greased with vaseline. Second, every bearing should be oiled and packed. Third, brushes and commutators should be watched carefully. Fourth, the distance between armature and pole pieces should be gaged weekly. If these parts are kept under observation in the manner suggested, locomotive troubles will become nearly negligible and actual breakdown in the mine will become practically unknown.

A suggestion in connection with the operation of the haulage system, which on its face may appear radical, is what might be termed a dispatcher system, corresponding to the system in use on all electric railways as well as railroads. We have reference to a man whose duty it would be to observe and systematize the movement of equipment in the mine and who would keep check on delays of the character recorded in Sections I and II. He should maintain a system of checks and charts which would throughout the day's work inform him as to the condition of the rooms and the relative location of cars, locomotives and machines. This man, if of the proper training, could also carry out or direct the tests and investigations recommended in the several sections. We have observed the partial adoption of this system in one or two cases, and the results have been gratifying. There is no question but that if the mines of the country would adopt such a system, and if competent men could be utilized for the work, exceedingly valuable results would follow in relationship both to cost and production.

There should be at the disposal of the mine officials or a dispatcher a comprehensive mine telephone system. A good telephone system is as necessary to efficient mine operation as it is to a trolley system or a railroad. It will increase production and reduce the cost. It is the opinion of coal properties in which telephone systems have been installed that these systems rapidly become essential to efficient handling of the mines.

Mines which have been equipped with telephone service, and these systems properly used, have shown marked increase in production through scheduling of main-line locomotives. The telephone tends to reduce the number of wrecks. It enables the mine foremen to keep in touch with each locomotive, making it possible for them to direct and control movements to advantage. We believe from observation of mines that have installed telephone systems that it is one of the best investments a mine operator can make. When properly installed, the maintenance is a small item.

(*To be continued*)

Legal Department

Federal Reservation of Coal Lands.—The provisions of the Federal land laws reserving "mineral lands" to the United States include coal lands. The statute enacted by Congress in 1894 granting sections 2, 16, 32 and 36 in every township to the State of Utah for the support of common schools, read in connection with other legislation, must be interpreted as excluding from such grant all section constituting mineral lands. (United States Supreme Court, United States vs. Sweet, 38 Supreme Court Reporter, 193.)

Damages for Personal Injuries.—An employee of a coal-mining company, in suing for injuries sustained while temporarily engaged in pushing loaded coal cars from a pit mouth to a check house at a daily wage of $2, was entitled to show that he was a skilled miner and able to earn higher wages under normal mining conditions. But it was improper to permit him to testify that he could earn from $6 to $7 a day, without any showing as to the prevailing wage scale for miners. And where plaintiff sought recovery for injury to his foot resulting from his stepping into a hole in the track along which he was pushing cars, it was improper to permit his witnesses to testify concerning the unusual or exceptional character of the hole, measured by general practices in coal mining, since that did not bear on the issue as to whether defendant was negligent or not. (Pennsylvania Supreme Court, Clark vs. Butler Junction Coal Co., 102 Atlantic Reporter, 952.)

Standardization of First-Aid Methods

BY LIEUT.-COL. C. H. CONNOR*
Medical Corps, United States Army

AS CHAIRMAN of the Committee on Standardization of First-Aid Methods and Rules for Conducting and Judging First-Aid Contests, Lieutenant-Colonel Connor submitted to the Seventh Safety Congress of the National Safety Council, held at St. Louis, Mo., Sept. 18 and 19, 1918, a report summarizing the work accomplished in connection with the committee's effort toward the standardization of first-aid methods. In presenting the report certain facts were cited, among which were the following: Preliminary letters were sent to the members of the committee, with a copy of the Red Cross circular describing first-aid contests. The rules and suggestions contained in that circular have proved satisfactory to the First-Aid Division of the American Red Cross in competitive events, and it was suggested that they be adopted as standard by the Mining Section of the National Safety Council. Replies to the letters were received from all but two members of the committee and a digest of the comments is contained in Lieutenant-Colonel Connor's remarks.

SINCE the last annual meeting of the National Safety Council a census has been taken of the opinions of industrial surgeons in reference to organizing first-aid teams in industrial concerns, the giving of prizes and medals for excellence in first aid among employees, and the holding of first-aid contests. Nearly all favor and indorse such methods.

In reference to organizing first-aid teams, some members of the committee are of the opinion that it should be compulsory, especially in hazardous occupations; others say that it is not required in small industrial establishments. The point is brought out that organized team work greatly stimulates the study of first aid, adds to the interest manifested and ultimately leads to prevention of accident. The unfavorable criticisms received were not altogether explicit. One industrial surgeon replied: "It is better to employ nurses"; another gave the opinion that it might lead to something being done which would later be regretted.

The majority of your committees—industrial surgeons and first-aid men—approve of giving prizes. A large number express a preference for medals rather than a cash prize. "It is a splendid idea and men are proud of these trophies"; "It is an incentive to greater energy and effort, and results in more efficient workers"; "has worked satisfactorily in the mining region," and similar expressions are read. "Give cash prizes and certificates of merit; medals should be reserved for big deeds," is another individual expression. Unfavorable comment was as follows: "Trade to commercialize man's duty to his fellowman" and "highest efficiency should be reached purely from the standpoint of relieving the suffering of a fellow employee."

The favorable comments far exceeded the unfavorable ones as to holding first-aid meets in companies, at which different first-aid teams may compete for the prizes. By stimulating a healthy rivalry first-aid meets make for greater efficiency and improve both individual and team work. They develop technique and lead to an exchange of ideas; the results obtained are well worth the effort in every way. The meets are particularly advantageous in mine rescue work and in industries where team organization is essential. One member cites the fact that exhibitions are to be favored, but not contests, as the latter provoke trouble. Another favors contests of this character, but opposes the giving of prizes. Unfavorable criticisms are that rivalry is gallery play, that it belittles the purpose and nothing is gained, and that it does not give a chance to the best, who are always modest and timid. Several surgeons state that the performance of a plain duty to one's comrades should not require reward.

INTER-COMPANY AND INTER-STATE MEETS

As to whether or not inter-company and even inter-state meets are productive of good results in maintaining interest in first-aid instruction, about one-fourth of the replies to the letters received indicate that the writers do not approve the idea of holding either inter-company or inter-state meets, while a few express their preference for inter-company contests. A majority, however, indorse the meets as outlined in the letter. In the opinion of one member, such meets result in an exchange of ideas and cause greater interest in the subject, thus tending to broaden and perfect the system and ultimately leading to standardization of first-aid methods. Another states that the spur of competition is helpful, while a third believes that a national association for first-aid instruction might be the outcome. Those who are opposed to first-aid contests say such meets are neither necessary nor practicable, that it is too difficult to put this kind of efficiency on a competitive basis, or that such contests should be limited to boys and girls, that they are not suitable for workmen.

E. E. Bach, director of the sociological department of the Ellsworth Collieries Co., has called attention to a "bone of contention" among safety men in the appointment of judges for first-aid contests. In the past it has been recommended that all such judges be physicians. Mr. Bach makes a good suggestion—that men who have completed a first-aid course and show a good general knowledge of first aid be permitted to act as judges as well as physicians.

C. E. Pettibone, chief safety inspector of Pickards Mather & Co., suggests that members of first-aid teams be limited to laboring men only, and that men should be taught to rely entirely on measures they can improvise from the materials at hand. The opinion of industrial surgeons to this question is unanimous, all believing that students should be taught to be able to improvise suitable materials when regular supplies are not available.

W. A. Lynott, in his Bureau of Mines manuscript, recommends that first-aid teams be selected with great care and with the thought that the men will remain in the employ of the company for years.

As to the advisability of permitting first-aid instruction to be given by other than physicians, the majority of opinions received regarding this matter are in the

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negative, the principal reason cited being that the layman cannot answer intelligently and correctly questions which may be asked during the course of instruction. A large number, however, agree that the first-aid instruction may be given with very satisfactory results by a thoroughly trained and experienced first-aider or graduate nurse. Some of the statements are amplified in the following manner: "Instruction should be given by a physician, but it is highly desirable to standardize the courses so that definite and prescribed teaching shall be followed; the entire course to be kept simplified and not left to the individual judgment of the instructor as to what shall be included or omitted." "First-aid instruction to be of value must be given by one who thoroughly understands the subject." "Intelligent first-aid instruction requires a considerable knowledge of anatomy and some physiology and symptomatology; a layman is not often in possession of this knowledge." "Physicians, unless they have spent considerable time in informing themselves on first-aid work, are not qualified to teach it as it should be taught today; furthermore, they do not always have sufficient time to devote to the subject. A salaried, well informed, first-aider with teaching ability, spending his entire time at the work, talks to employees in a language which they can understand, not 'over their heads.' He drills them personally and obtains results." It is recommended, however, that previously prepared lectures on first aid should be given by a physician, mentioning briefly details of anatomy and physiology, and presenting reasons why certain first-aid procedures should or should not be followed. The advisability of giving elementary instruction in anatomy and physiology in a first-aid course is not questioned.

First-aid treatment is meeting the basic and immediate requirements of the sick and injured from an anatomical and physiological standpoint. As the life of an injured person often depends upon the care he receives from the first individual to aid him, it is important that people be taught the rudiments of physiology, anatomy and the principal factors to be met in an injury. For instance, in resuscitation, something of the mechanism of the respiratory apparatus should be taught; in the control of hemorrhage, knowledge of the location of the most important and vulnerable blood vessels is necessary.

In furtherance of first aid and accident-prevention work, and the dissemination of knowledge in the homes of the workmen, it is recommended that all employees should be instructed by lectures and demonstrations and also by giving them textbooks.

Did Rope Break from Sudden Jerk?

On the morning of Sept. 10 a cable broke at the Protection shaft of the Canadian Western Fuel Co., Nanaimo, B. C., and 16 men were plunged to their deaths. An inquest was held at Nanaimo on Sept. 12 by Coroner Hickling. He soon came to the conclusion that by delaying the inquest till Oct. 22, valuable information as to the condition of the rope at the time of the disaster might be obtained, and, in consequence, postponed the hearing till that time.

William Fleet Robertson, provincial mineralogist, has been sworn in as an official of the court, and he will take the broken cable to eastern Canadian laboratories where he will have "critical microscopic and chemical" examinations and tests made under his supervision. He is also taking samples of the water which flows into the shaft so that he may have it analyzed to ascertain whether it contains any matter likely to cause rope corrosion or deterioration.

James Menzies, rope expert, who is employed by the Canadian Western Fuel Co. to examine, at regular intervals, all cables in use in the company's mines, was one of the chief witnesses. He informed the court that he made an inspection of the cable once a week. His last inspection was made on Sept. 4. On that occasion he had passed the cable as was his custom through his closely gripped hand for its full length. Had there been any broken strands then he would have noted them, either when they struck his flesh or met his eye. He also said that his practice was to inspect the safety clutches and that he had found these, also, in good working order during his last visit.

Entire Rope Was Not Inspected

Another important witness was C. Wallbank who, until Aug. 28, was employed by the company to make the daily inspection of cables, etc., required under the terms of Section 91, General Rule 36, of the Coal Mines Regulation Act. On the date indicated he had left the service of the company. Up to that time he had made the daily inspection required and filed the necessary report. He had never found anything wrong with the rope in question. It appeared, from the evidence of C. Nicholson, that the latter took Mr. Wallbank's place. The former swore that he had inspected the cable and the cage, but on cross-examination it was found that this inspection was only of the 50 ft. of the cable immediately above the cage, whereas his daily report would lead to the belief that it extended the full length.

S. Tembey, the engineer in charge of the operation of the hoisting machinery at the time of the break, swore that he was not using steam or brakes at the moment the cable gave way. William Woodman, an engineer of 30 years' experience, argued that the application of brakes could not have been the cause of the breakage of the rope, because it was evident that the rope broke when the cage was only one-quarter way down and at that point there could be no advantage in applying the brakes. He came to the conclusion that the rope broke at the point stated by him because it snapped 157 ft. from the cage and the shaft was 650 ft. deep. The inspector of mines, J. Newton, stated that he inspected the mine once a month, but did not inspect the ropes himself.

William Woodman in the afternoon of Sept. 13 admitted that he had heard the men make complaints as to the jerky way in which they were lowered at the Protection shaft. When the attorney asked for the names of these men Mr. Woodman refused to reveal them, declaring it unfair to give hearsay evidence. On an appeal made by the attorney to the parties in question, several of whom were said to be in court, one of them corroborated the statement. The doors were then closed and all the miners who had descended the shaft were put on the stand and sworn. Some corroborated the statement that there were complaints made about the manner in which the cage was jolted.

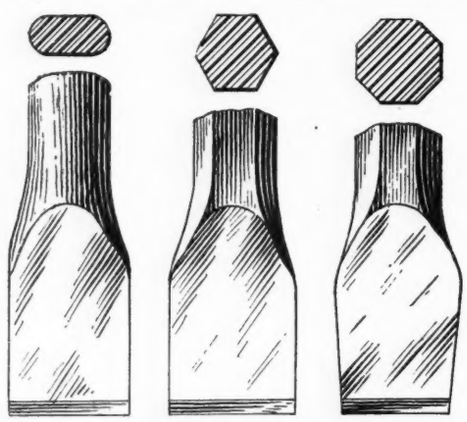
The Cold Chisel

By J. A. LUCAS
Ozone Park, New York

SYNOPSIS—*To the average layman a cold chisel is a cold chisel. This article shows, however, that there are cold chisels and cold chisels. The shape of a chisel is determined by the work to be performed and the kind and texture of the material to be cut. It is highly important to keep both ends of a chisel in proper shape if best results are to be secured.*

THE machinist's cold chisel is made from the three forms of steel shown in Figs. 1, 2 and 3. Of these the first is preferable, because it has two broad flat surfaces diametrically opposite which form guides to the eye in holding the chisel on the grindstone and aid in grinding the facets that form the cutting edge true. Furthermore, as the cutting edge is in a plane parallel to these flats, they serve as a guide to show when the chisel edge lies parallel to the work surface. This is requisite in order to produce true and smooth chipping.

To make a chisel, a piece about 6½ in. long is first cut from the bar. One end is heated to a cherry-red heat and the head formed by slowly rotating the tool and hammering down the steel until the end becomes conical



FIGS. 1 TO 3. VARIOUS TYPES OF ORDINARY COLD CHISELS

for a distance of about ⅝ in. The steel is now reversed, and after a heat about 1½ in. long has been made the metal is drawn down to a wedge shape, care being taken to keep the edges from spreading.

It is important to note that the under side of the chisel lies flat on the anvil, and a flatter or smooth set-hammer should be used toward the end of the process to smooth the work. If possible the chisel should be made in not more than two heatings, in order to maintain the original hardness in the steel. The finished forging should be allowed to cool off on the anvil while steady light hammer blows are struck upon it near the cutting edge. This operation renders more dense the molecular structure of the steel and greatly increases the life of the tool.

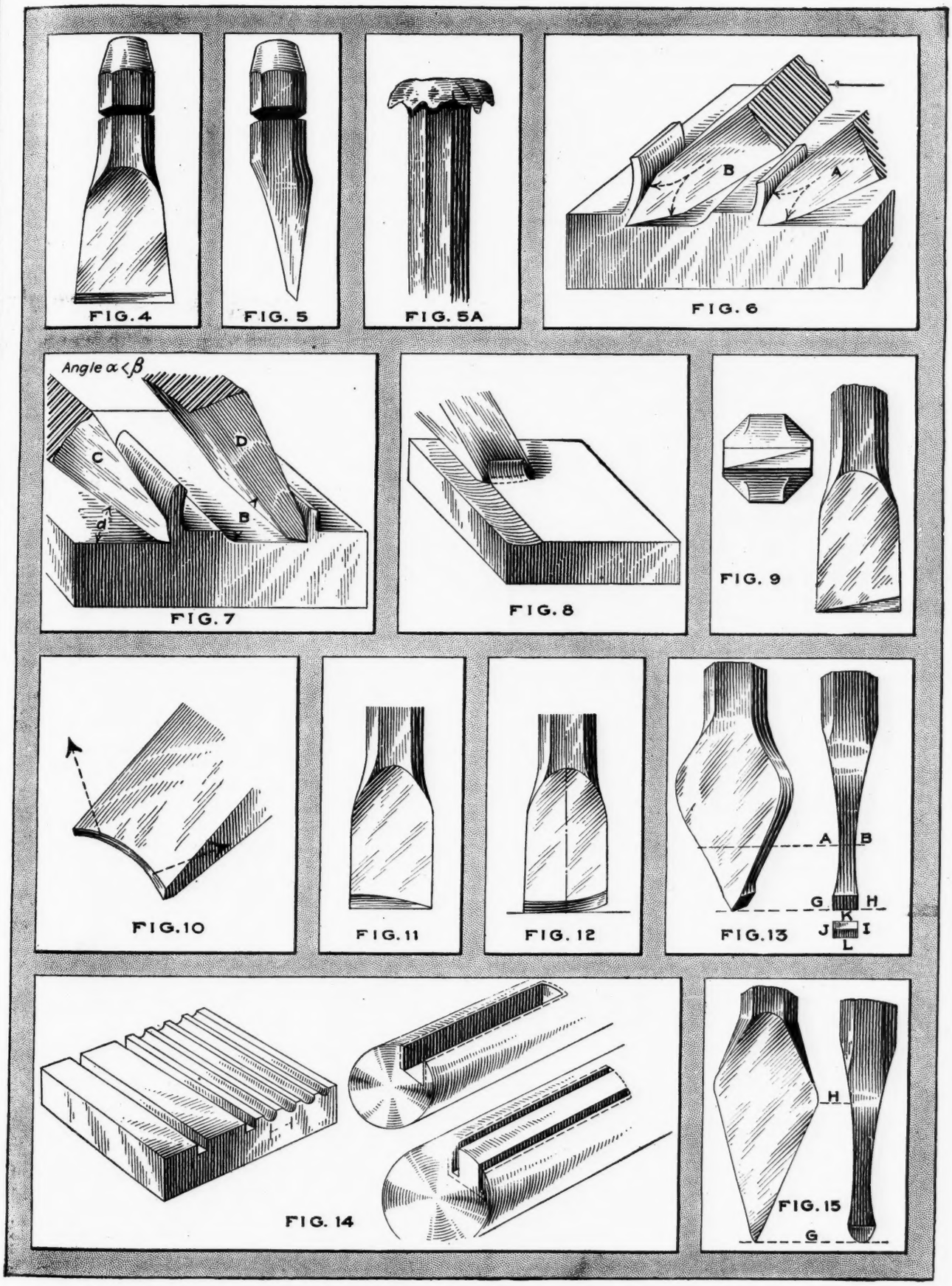
The chisel of ordinary size should measure between 8 and 9 in. over all, assuming that it is made from a bar of octagonal steel measuring ¾ in. across the flats. The width of the tapered portion should not exceed 1 in., and the sides should be parallel for 2½ in. in a tool intended for general work, as shown in Fig. 2. For hard metal a chisel should be slightly tapered toward the point (Fig. 3), and for soft metals it should be bell shaped, as shown in Fig. 4. Soft metals are cut or chipped without lubrication, but wrought iron and steel yield far better results when the chisel edge is first rubbed on a piece of oily waste.

The width of the chisel may be made greater (as in Fig. 4) for use on brass or cast iron than when intended for wrought iron or steel, as on account of the toughness and hardness of wrought iron and steel the full force of a blow from a 1¾-lb. hammer, having a handle 13 in. long, may be struck on a chisel about ¾ in. wide without danger of causing the metal to break out below the chipping line; but if such a chisel be used with full-force blows upon cast iron or brass the metal is liable to break out in front of the chisel, the line of fracture often passing below the level that it is intended to chip down to. Hence if a narrow chisel is used lighter blows must be delivered. By using a broader chisel, however, the force of the blow is distributed over a greater length of cutting edge, and full-force blows may be employed without danger of breaking the metal.

The cutting end of the chisel should be ground thin, as in that case it cuts both easier and smoother. The total length of a chisel, when new, should not exceed 8 in. If made longer it is not suitable for heavy or smooth clipping, as in that case it will bend and spring under heavy blows and cannot be held steady. The forged part should not exceed 2½ or 3 in. in length, as a long taper is highly conducive to springiness, whereas solidity is of great importance both to rapid and smooth work. The facets forming the cutting edge should be straight throughout their widths, as at *B* in Fig. 6, and not rounded as at *A*. Straight faces permit the face next to the work to form a guide in holding the chisel at the proper angle to maintain the depth of the cut. This angle depends upon the nature of the material to be chipped. The more acute the angle, the better the chisel will cut and the less will be the effort of raising the chip, thus increasing production.

From the viewpoint of economy, one would be tempted to reduce this angle to a minimum. But we have to consider the resistance and durability of the tool, and make the angle according to the toughness of the material to be cut. The cutting angle may therefore safely be made 65 deg. for machine and other kinds of steel, 50 deg. for cast iron and brass, and 30 to 35 deg. for copper, babbitt and lead.

The more acute these angles the nearer will the body of the chisel lie parallel with the work and the more effective will be the hammer blows. Thus in Fig. 7 chisel *C* shows the position of the tool for wrought iron, while position *D* shows that for steel. The edge angle should always therefore be made as acute as the hardness of the material will permit. If such an angle is too



FIGS. 4 TO 15. VARIOUS SHAPES OF CHISELS AND EXAMPLES OF THEIR APPLICATION

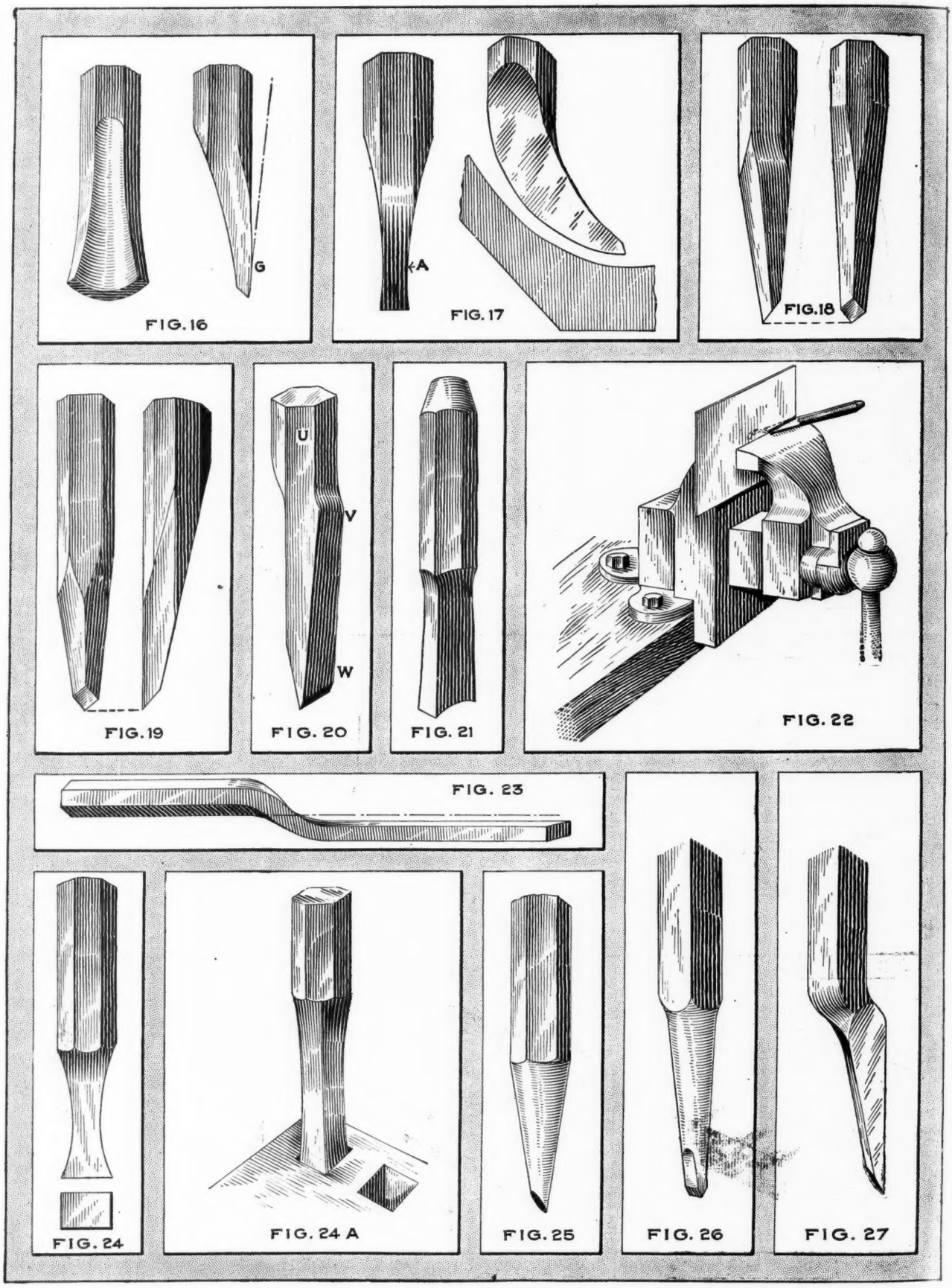


FIG. 16 FIG. 17 FIG. 18

FIG. 19 FIG. 20 FIG. 21 FIG. 22

FIG. 23

FIG. 24 FIG. 24 A FIG. 25 FIG. 26 FIG. 27

FIGS. 16 TO 27. SPECIAL FORMS OF CHISELS AND SOME OF THEIR USES

acute, the cutting edge will be apt to bend, while if not sufficiently acute it will not cut keenly; hence the object is to make this angle as acute as possible without causing the cutting edge to bend or break throughout its length.

The cutting edge should be slightly rounded in its length. This will strengthen it and also enable a fine finishing chip to be taken, as in Fig. 8, the width of the chip not extending fully across the chisel width. Thus the corners are not under duty and are not, therefore, liable to break or dig in and prevent smooth chipping. In some practice the edge is made straight throughout its length, as shown in Fig. 2. This is permissible in heavy chipping when a cape chisel has been used, but in any event an edge rounded slightly throughout its length is preferable. If the edge is hollowed, as shown in Fig. 10, the chip acts as a wedge to force the corners outward, as denoted by the arrows. This may cause breakage under a heavy cut and, furthermore, a smooth cut cannot be taken when the corners of the chisel meet the work surface.

If the edge facets are ground less on one side than on the other, as in Figs. 9 and 11, the edge will not be parallel with the flats of the chisel, so that in holding the tool the flats will not form a guide to determine when the edge lies parallel to the work surface. Fig. 12 shows a wrongly ground chisel that will never cut parallel to the surface of the work. The edge at its center should also be at a right angle to the center line of the chisel, as denoted on the left half of Fig. 12, for if not at a right angle the chisel will be apt to move sideways with each blow and cannot be held steadily.

The chisel should be held as close to its head as possible, so that the hand will steady the point where the blow is received. The tool should be pushed forward firmly and steadily to its cut. This will greatly facilitate rapid and smooth chipping. When working on wrought iron and copper it is found better to occasionally moisten the chisel with oil or turpentine, the former being preferable.

The head of all chisels should be dressed round and somewhat reduced in diameter, as shown in Figs. 4 and 5. When the head becomes battered, as in Fig. 5A, it should be redressed as small pieces of steel are apt to fly from a bushed chisel head, embedding themselves deeply in the hand holding the chisel.

The flat chisel can be modified in form to suit special conditions, as, for example, the cutting of the flat sides of a mortise require a chisel the axis of which will follow a line nearly parallel to the work surface. Such a chisel is shown in Fig. 5, in which one flat is parallel with the length of the chisel, having at the end one wide facet at a slight angle with the length. This is done in order to be able to guide and control the cutting edge of the tool.

All that has been said respecting the flat chisel applies equally well to the cape chisel, except that the sides at right angles to the cutting edge are narrower than the shank and that the sides parallel with the cutting edge are spread wider where they join the shank, as in Fig. 13. The cape chisel will cut up some ugly capers if not properly forged and ground. If not made narrower at *AB* than at *GH* it will, when the corners wear dull or tapering at *GH*, wedge and possibly split a frail piece on which it is being used to cut a slot. Referring to the end view, if the sides *IJ* are not ground approximately at right angles with *KL*, the chisel will twist and hang, and cannot accurately be guided in a slot or keyway.

When cuts of $\frac{1}{8}$ in. or deeper are to be taken, it is necessary to precede the flat chisel by grooves cut with a cape or round-nosed chisel. The distance apart of these grooves should be less than the width of the flat chisel, thus leaving strips to be chipped by the latter. This method is used in chipping broad surfaces, but is unnecessary when the area is quite small. The surface shown in Fig. 14 represents this preparatory grooving. Besides the uses above given, the cape chisel is employed for cutting keyways in shafts, pulleys, gears, etc., also for cutting slots.

In cutting a keyway with the cape chisel, if the keyway be made, say, $\frac{5}{8}$ in. wide, the cape should be about $\frac{1}{32}$ in. narrower. The remainder of the keyway is removed by a file. If the keyway be $\frac{3}{4}$ in. or wider, it is

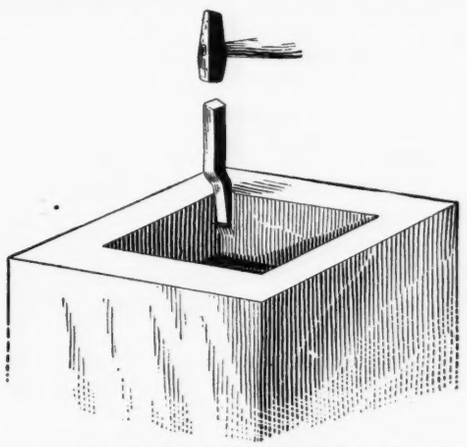


FIG. 28. HOW CHISEL SHOWN IN FIG. 27 IS USED

better to use a cape chisel less than half the width of the keyway and cut two grooves.

The round-nosed chisel, Fig. 15, may be straight from *H* nearly to the point *G*, but should be bevelled near *G* so that the head of the chisel may be raised or lowered to govern the depth of the cut. The round nose should also be wider than the metal higher up, so that the chisel head may be moved sideways to govern the direction of the cut, as is the case with the cape chisel.

The cow-mouth chisel, Fig. 16, should be bevelled from *G* to the point, so as to permit governing the depth of the cut. It should have a greater curvature than the corner it is to cut out, so that its corners cannot wedge in the work. The name of this chisel is derived from its curved shape; a better name, one not infrequently used, is "gouge," on account of its similarity to the wood-cutting tool of this name. This tool is used for enlarging holes or for chipping curved surfaces.

The oil-groove chisel, Fig. 17, should be wider at the cutting edge than at *A* for reasons similar to those given above, and of less curvature than the bore of the brass of bearing in which it is to cut the oil groove.

The diamond-point chisel may be made in two ways. First, as in Fig. 18, for shallow holes, or as in Fig. 19, for deep ones. In shallow holes the chisel can be leaned over, whereas in deep ones it must be held straight so that its body may not meet the other side of

the hole, slot or keyway. The form shown in Fig. 18 is the strongest, because its point is brought into line with the body of the steel. The side chisel, Fig. 20, for cutting out the sides of keyways or slots, should be bevelled from *W* to the cutting edge for the reasons already given, and straight from *W* to *V*, the line *VW* projecting slightly above or beyond or outside of the body *U*. All these chisels are ordinarily tempered to a blue color.

The ripper, shown in Fig. 21, is a necessity to the repair machinist for cutting off boiler tubes, tanks, sheet metal, etc. The shape of the cutting blade is on the style of that of the cape chisel. The cutting edge is slightly hollowed to guide the tool in the course of cutting. Sheet metal held in the vise may be much more easily sheared with the ripper than with the ordinary flat chisel. This process is shown in Fig. 22.

The drift, Fig. 24 and 24A, is a tool that is sometimes used instead of a file for enlarging or correcting square, rectangular or polygonal holes. The drift has no cutting edge proper, but the end is at right angle to the body and cuts on the same principle as the punch used in punching holes in boiler plates, or somewhat like the ripper mentioned above.

The key drift is for driving keys out of pulleys, gears, etc. Like the drift, its small end is rectangular in cross-section, but it is not intended to do any cutting, as shown in Fig. 23.

The round-nosed chisel, Fig. 25, and the flat chisel, Fig. 26, are small size and used on light work. The chisel, Fig. 27, is fit for deep, internal work, and is shown in use in Fig. 28.

In tempering chisels for general use they should be drawn nearly to a blue, which gives a tough temper that will stand up well on all metals except chilled iron and hard steel. For these latter metals, in drawing the temper the chisels should be plunged in water just at the time the color starts to change from straw to blue. In exceptional cases a bright straw color is kept, but in use hammer blows must be comparatively light, otherwise the brittle edge will fail.

No matter how carefully a chisel may be tempered it may be softened in a few seconds by overheating the edge at the emery wheel. To avoid this a constant flow of water may be directed to the point of the chisel when grinding. If an automatic water supply is not available, the chisel must be frequently dipped in a can or other container filled with water.

Possibilities of Using Peat as Fuel

In view of the dangers of another coal shortage the Director of the U. S. Geological Survey calls attention to the practicability of using peat as fuel in some localities and offers some suggestions as to the preparation, storage, value and use of peat.

Vast deposits of peat that could be converted into fuel are found throughout Minnesota, Wisconsin, Michigan, New York and the New England States, and in the northern parts of Iowa, Illinois, Indiana, Ohio, Pennsylvania and New Jersey, according to C. C. Osbon, of the Geological Survey, who has recently been studying this subject. Many peat beds occur also on the Atlantic coastal plain from New Jersey to southern Florida and westward along the Gulf coast to the Mexican boundary. This coastal plain is rather remote from the known coal fields and contains few other mineral fuels. The preparation and storage in farming communities and villages of peat fuel taken from these deposits by the owners of small bogs and by citizens' associations for distribution among their members would not only increase the local fuel supply and in many localities prevent a recurrence of the suffering caused by our recent coal shortage, but would release railroad cars that will be vitally needed for other purposes.

Fuel Value of Peat

Peat, or muck, as this mineral is frequently called, consists of partly decayed plant remains that contain enough carbon to ignite and burn freely when dry. In texture it ranges from a fibrous, imperfectly decayed kind, through progressive degrees of decomposition, to a thoroughly disintegrated type, and varies correspondingly in color from light yellow to jet black.

Peat in an undrained bog contains about 90 per cent. of water, which must be reduced to 30 per cent. before it can be used for fuel. By thoroughly draining the deposit approximately 10 per cent. of the water in the peat may be removed, but the remainder, which is held in microscopic plant cells and minute intercellular spaces, can not be reduced below 70 per cent. without drying in the open air or in a heated chamber. Artificial drying, however, requires so much heat in comparison with that obtainable from the fuel prepared by this process, that so far as the U. S. Geological Survey is aware, it has not proved commercially feasible.

The value of a given deposit of peat as a source of fuel is dependent on many factors, most important of which are degree of decomposition, heating value and ash content. Coarse-textured fibrous peat makes fuel that is inferior to the black, compact, thoroughly decomposed kind, unless that kind contains a large proportion of ash. The maximum quantity of ash that is usually considered allowable in peat for commercial use has been placed between 20 and 25 per cent., but if the content of ash exceeds 20 per cent. of the total weight of the dry peat it is scarcely worth the labor of production, even for home use. The heating value and ash content of peat fuel intended for domestic consumption may be determined by a simple practical test. A typical sample should be taken from the bog, thoroughly macerated, dried and weighed. If, when burned in an ordinary heating stove, the heat generated is almost equal to that produced by bituminous coal, and after complete combustion the weight of the ash does not exceed 20 per cent. of the weight of the dry peat before burning, its usefulness as a fuel for domestic purposes is established.

Methods of Preparation

The season for drying peat begins about Apr. 15, or as soon as the frost is out of the ground, and ends in September, except in the southern peat region, where it is somewhat longer. Present industrial conditions in the United States prohibit the manufacture of large-capacity peat-fuel machines for operation this year, as such machinery, on account of the small demand in this country, has to be specially designed and constructed. It seems, therefore, that peat intended for use next winter will have to be prepared either by hand or by

existing machinery that can be readily converted to use for producing peat fuel.

The hand-cut process of preparing peat, which is widely used in Ireland, seems most practicable for the owners of small deposits in the United States. Before this method can be used the deposit must be thoroughly drained and cleared, and the turf removed from its surface. Most bogs of the built-up type—that is, those which were formed by the deposition of the remains of plants that grow near the ground-water level—can be drained to the bottom by a simple system of surface ditches. Lake bogs, in which the deposit has accumulated below a permanent water level, can not generally be drained far below the surface of the peat without incurring great expense, and are therefore not so well adapted to hand digging as built-up beds. However, many lake bogs in the northern peat region, where most of the marshes in which this mineral has accumulated were formed during the Wisconsin or last glacial stage, may be sufficiently drained for peat recovery by means of a short drainage canal connecting the edge of the basin at the lowest level with an adjacent stream.

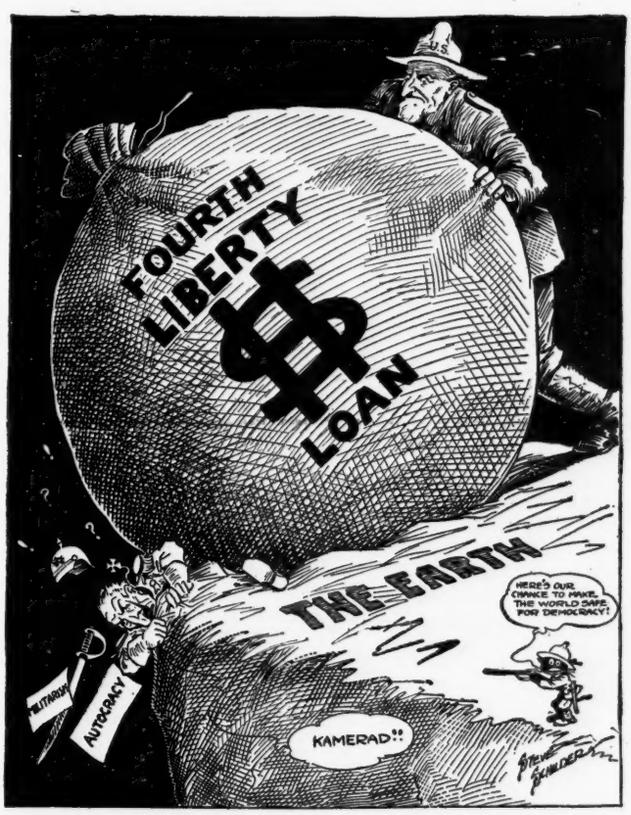
How the Peat Is Dug

After the surface of the bog has been cleared the peat is dug in brick form with a special tool called a slane. This instrument, which can be made by a blacksmith, is a narrow spade with a sharp steel lug welded on one side at right angles to the edge of the blade. The blocks of peat range from 8 to 10 in. in length, from 4 to 7 in. in width, and from 3 to 6 in. in thickness, their dimensions depending on the size of the slane. As they are dug they should be removed to the drying grounds and stood on end or placed on covered racks. At the end of about four weeks, during which they should be frequently turned until their moisture content is reduced to about 30 per cent., the blocks are usually ready for storage. As cut peat absorbs water rapidly, great care should always be taken to protect the dry blocks from rainfall. Peat fuel prepared in this way is bulky, easily crushed, and burns rapidly with considerable waste. In heating value it is superior to wood, but it is unfitted for commercial use.

To produce peat fuel of better quality and in larger quantity than is possible by hand, the machine process should be used. This process, which should be practicable for the use of citizens' associations desiring to prepare fuel for distribution among their members is, so far as known by the Geological Survey, the only one that has proved commercially successful in Europe. The machinery for a small plant is simple and could be quickly obtained and easily operated. It consists essentially of an excavator and a macerator. The steam shovel could be used for digging peat from drained deposits; the dipper dredge is well adapted to removing this mineral from undrained deposits. The purpose of the macerator is to grind the constituents of the wet peat into a homogeneous pasty mass, which may be shaped into compact blocks. In principle and form the latest types of such machines are similar to the pug mill or grinding machine for plastic clay. Many of the experimental plants in the United States have used brickmakers' pug mills, with very slight changes, to grind peat, and they have proved to be well suited for the purpose. These machines may be readily obtained from dealers in clay-working machinery. After being thoroughly macerated the peat should be shaped into blocks as it issues from the machine or spread in a layer, from 8 to 12 in. thick, on the drying grounds and the bricks marked off by hand as the spreading proceeds. When partly dry they are loosely stacked or placed on drying racks and thereafter handled the same as cut peat.

A specially designed and constructed machine must be used for the production of peat fuel for market. Such a machine consists of a receiving hopper attached to a vertical or horizontal cast-iron body, in which revolve one or two knife-armed shafts. These shafts are also provided with spirally arranged flanges for moving the peat to the grinding knives and advancing it to the device for cutting it into bricks of uniform length as it issues from the orifice of the machine.

Machine peat that is allowed to dry slowly contracts into a dense mass covered by a gelatinous skinlike substance called hydrocellulose. After the moisture has been reduced to about 25 per cent. this coating renders it impervious to water, even when immersed. Peat manufactured by this process makes excellent fuel. In heating value a ton of machine peat is equal to about 1.3 tons of wood, seven-tenths of a ton of good bituminous coal, or half a ton of anthracite. Despite the disadvantages of cut peat, air-dried machine peat is well adapted for domestic use. It is clean to handle and burns freely, yielding an intense heat and producing no soot or other objectionable deposit. For open grates this fuel is nearly ideal, and it is said that peat may be burned in the same stoves as coal and wood. However, the best results could probably be obtained by burning it in a stove with relatively small grate openings and a restricted draft.



PUT YOUR CUSH IN THIS BIG PUSH

How Prices of Bituminous Coal Were Fixed by the Fuel Administration*—II

By CYRUS GARNSEY, Jr., R. V. NORRIS and J. H. ALLPORT
Engineers to United States Fuel Administration

THE great mass of cost figures, obtained from the analysis of the cost of operators mining over 95 per cent. of the entire production of bituminous coal in the United States, would be merely confusing and of but little practical value if presented in tables of figures and it was considered necessary to devise some plan to present these graphically so that they might be studied and compared with a minimum of effort and with maximum efficiency. After many trials, a chart was evolved which appears to have satisfactorily accomplished the ends sought.

The costs for each district, both exactly as reported and as adjusted were arranged in order by 1c. increments, beginning at the lowest cost, with the tonnage at each separate cost, whether from one or more operations; the percentage of total tonnage at each cost was calculated, and the cumulative percentage beginning at the lowest-cost tonnage was obtained.

Charts.—The percentages thus obtained were plotted on 10 by 10 cross-section paper, resulting in a diagram like Fig. 1. The dotted line shows the costs reported, and the full line the adjusted costs. The percentage of the total output between, or up to, any limits of cost can be determined by simple inspection. The "bulk line," or line of indispensable coal which must be assured of a minimum profit, after study of the conditions and necessities of any district, can be properly located, and from this a minimum profit necessary for the district can be determined.

Bulk Line Required Careful Study

The "bulk line" is a matter requiring very careful study. Its location must be such as to conserve and encourage all necessary operations and thus assure the maximum coal supply from each district. It is almost invariably found that at the high-cost end of the diagram are collected most of the doubtful enterprises. These include: Mines which have failed under normal competitive conditions and have been reopened under the stimulus of the high prices preceding Government control; mines abandoned as exhausted and reopened for the few remaining pillars; new enterprises in the development stage; mines opened on beds so thin or of such poor quality that they could not operate under normal conditions; small mines on outcrop coal, often of poor quality, which have neither capital nor equipment for economical working; mines which have encountered faults or in which the coal has thinned or split, or the quality has so deteriorated as to prevent working at a reasonable cost; and, not the least of this group, mines so badly managed as to show unwarrantable cost of operation.

All these classes of mines are unjustifiable under war conditions. They use labor inefficiently. Often their records show less than half the tonnage per employee usually obtained in their district, and their elimination is an economical advantage to a district in releasing labor to more efficient mines.

In this high-cost group occasionally are found mines which have a coal of unusually high quality or fitted for special use, for which a market at prices above those of the district has always existed. Such mines, on proving their special conditions, may receive consideration for special prices sufficient to allow a fair profit on their higher costs.

After a study of all conditions the "bulk line" is located as far as possible to exclude the classes of operations above mentioned, and to include all mines operating economically and efficiently. The margin above the "bulk line" is sufficient to allow all but a very small percentage of the tonnage to be produced without actual loss, but with less than the minimum profit applied to all mines up to the "bulk line."

Charts Divulge No Secrets

The charts have the further advantage that they show all the costs of any district without divulging the costs of any operation, yet by a very simple system of confidential keys the position of any separate operation can be almost instantly found and its cost sheets located.

The charts have the further advantage that almost any desired information as to costs or tonnage, averages, totals within desired limits, margins, excessive and subnormal costs with the tonnage involved, and other items of information often required can be obtained very rapidly and with a minimum expenditure of time or labor. On one occasion, two members of the committee calculated in a single evening the weighted average costs, both reported and adjusted, for over three-fourths of the entire bituminous coal output of the country.

It is inevitable that mines should show wide variations in cost, due to the varying thickness and character of the beds worked, and to apply a single price to all the mines of a state would result in either allowing an unreasonable profit to those working the better and thicker beds, or absolutely put out of business the higher-cost districts.

Where an area examined shows wide variation of cost, it becomes necessary to employ some plan of separation, and to segregate into groups those mines operating under similar conditions. Such districting may be based on difference in beds, on thickness of coal, or by geographical and geological districts.

Districting by beds is only occasionally practicable, for the following reasons: (*a*) Variation in thickness and quality in the same bed. (*b*) Difficulty of identification of beds. (*c*) Splitting of beds, changing one thick bed to two or more thin ones. (*d*) Changes in mining conditions in the same bed, making radical differences in cost of mining.

*Paper presented at the Colorado meeting of the American Society of Mining Engineers, September, 1918. The first part of this paper appeared in *Coal Age*, Oct. 10, 1918.

Districting by thickness of beds seems at first glance the most logical method, but it has the fatal objection that, as nearly all beds become thin in places, two or more costs will be found in contiguous mines and often in the same mine. Further, this districting leads to gross profiteering, by attempting to classify mines by the thinnest coal, not by the average.

The terms "thick" and "thin" beds are particularly dangerous, as what would be considered thick in one region may be classed as thin in another, and the reverse; it is therefore manifestly undesirable for the United States Fuel Administration officially to designate any particular thickness as the dividing line between thick and thin.

Districting geographically has the great advantage of making divisions susceptible of accurate description and eliminating all questions as to the proper price applicable to any colliery. It generally puts together mines having the same conditions and normally competing, avoids varying prices for coal of the same quality and character, and simplifies distribution and marketing. The difficulties in applying this method are greatest in fields where numerous beds of varying thickness and character are worked, resulting in considerable variations in price. It is also frequently difficult properly to classify operations near the borders of adjoining districts, and geographical districts are hence necessarily subject to some adjustment of boundaries.

Further, in designating districts, labor conditions are necessarily carefully considered. Neither miners nor operators wish to have the scale of wages changed in any mine by the throwing of such mine from one wage district to another, and before deciding on the boundaries of districts, it has been found essential to obtain the wage-scale and the boundaries of wage-scale districts. Further, it is found that in making up the wage-scales, some very accurate districting has been done, and maps showing these wage districts are of great assistance in the final determination of proper boundaries.

It is the practice of the committee to classify mines under study, first by counties or fields, and then to separate or combine them, as the case may be, to obtain districts containing, as far as practicable, mines operating under the same general conditions.

Diagrams 2 and 3 show the result of districting in an important territory producing about 75,000,000 tons of coal per year. Diagram No. 2 shows the costs for the entire area, and the very wide variations in cost due to different mining conditions are apparent. Diagram No. 3 shows the costs in the three districts finally segregated. These all permit price fixing without giving excessive profit, or putting the high-cost districts out of business, thus assuring the mining of the required tonnage of coal.

It will be noted in the three-district diagram that the low cost of No. 1 corresponds with the high cost of No. 2, and the low of No. 2 with the high of No. 3. If prices had been fixed on diagram No. 2, for the entire state, the "bulk line" would have been placed at about $1.90. This would have put the whole of District No. 1 and 36 per cent. of District No. 2, or a production of about 500,000 tons per month, above the bulk line, giving these regions an insufficient margin, and checking production, if not stopping it; at the same time it would have given to District No. 3, producing 5,700,000 tons per month, 30c. per ton or over $1,700,000 per month unnecessary margin. Similar conditions throughout the country have been handled in this manner.

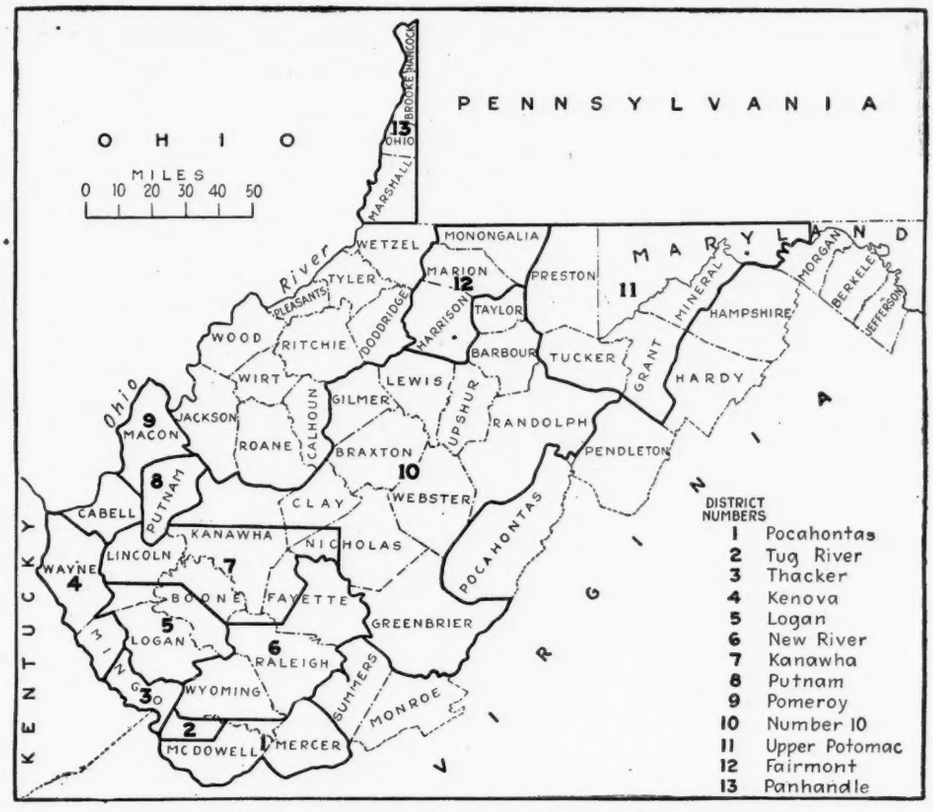


FIG. 4. MAP OF WEST VIRGINIA, SHOWING PRICE DISTRICTS

It will also be noted that the variation between high and low costs increases with the higher-cost districts. The angle of slope of the cost line increases from No. 3 to No. 1. This results in a somewhat greater margin between the average cost and the "bulk line," which is logical and necessary. The high-cost mines, having greater expenses, need a larger margin to attain the same percentage of profit. As an example of the districting necessary in exceptional cases, Fig 4 is a map of the districts in West Virginia. On fixing prices for these, only seven different prices were found necessary for 13 districts.

The "bulk line" of the chart, with the margin added by the Fuel Administrator, gives the necessary realization for a district, but it does not completely fix prices.

The price for run-of-mine is usually fixed at the realization price, but where screening is desirable it is necessary to fix a spread of price so that the operator receives as much as 1c. or 2c. more for the screened product than for run-of-mine.

The tonnage of run-of-mine, prepared, and screenings for each district is obtained from the cost sheets; then the average division of the screened coal in percentage is computed and from this margins are determined which will permit screening but not too greatly stimulate the practice. For instance, if a coal will produce 55 per cent. prepared, and 45 per cent. screenings, an equal margin above and below the run-of-mine price would be indicated; but a coal which would produce 30 per cent. prepared and 70 per cent. screenings would need a much larger margin for prepared above run-of-mine, and a very small margin below for screenings.

If the "spread" is not correctly figured, the result is to make some combination unduly profitable, with the result that only that combination is found to be made. In some instances, run-of-mine from particular collieries shows a few cents margin over screened coal, and these collieries will produce run-of-mine exclusively. In other cases, prepared and screenings are more profitable, with the reverse result.

Unusual Sizes.—In many parts of the country it was found that special sizes were customarily made. In Illinois, for instance, a considerable amount of coal is sized, about in accordance with anthracite practice, into egg, stove, nut, pea and buckwheat, and in certain states so-called "modified run-of-mine," passing through 2, 3, 4, 5, 6 and 8-in. bars is a standard product. These specially prepared and modified run-of-mine sizes cost the operators something extra, and will only be made if the prices received yield a profit over the regular procedure. The Fuel Administration has met this condition by allowing special prices for specially sized coal, and for modified run-of-mine sizes, but all such prices are so calculated as to allow only enough profit on any combination to permit its existence and not enough to encourage the forcing of such size on consumers.

In price fixing of this sort, it is essential to obtain, from several independent and reliable sources, the percentages of the various sizes produced by screening from each coal likely to be used in this way, and carefully balance the costs, losses, and percentages of each size produced, to arrive at a proper price.

It is also necessary to evolve methods of preventing profiteering on special prices. For instance, it was found that after making sizes down to buckwheat from bituminous coal, in some cases the fine screenings, far below the standard mesh of the district, were run into the regular run-of-mine and sold at the run-of-mine price. This was handled by an order allowing a maximum of 30c. below *screenings price* for any mixture of the fine coal below 2½-in. mesh with any other coal. This is easy to police, as the mere report of sizes below the standard screenings mesh of any district involves the report of special fine screenings or "carbon" at the price 30c. below screenings, and if such is not found, it is assumed to be mixed with commercial sizes.

Margin.—The difference between the mine costs, arrived at as described above, and the price is the "margin." This is far from being the profit, as many items of expense necessarily incurred are not included in the mine price. Such are: (*a*) Selling expense. (*b*) Improvements. (*c*) Developments to increase output. (*d*) Excess of capital expenditures over normal costs. (*e*) Contracts at lower than "Government Prices." (*f*) Interest on bonded indebtedness. (*g*) Income taxes. (*h*) Excess-profit taxes. (*i*) Profit on investment.

None of these items is properly included in "cost of production" under normal conditions, but in a war situation it is practically impossible to obtain money to capitalize expenditures for excess improvements, and developments, which would normally be capitalized and properly included in the permitted depreciation, particularly as all such expenditures are made at from two to three times their normal costs; it is a serious question whether the "margin" allowed should not be made large enough to include at least this class of expenditures.

As our Government has been forced into this untried realm of price control by war conditions, it may be interesting to know the results. These, in general, are available only as applied to the latter months of 1917, before the labor increase, compensated for by the 45c. general advance in coal prices above referred to. Diagram No. 5 shows the average costs, "bulk lines," and prices fixed for practically all districts in the country, as of August and September, 1917, and covers about 84

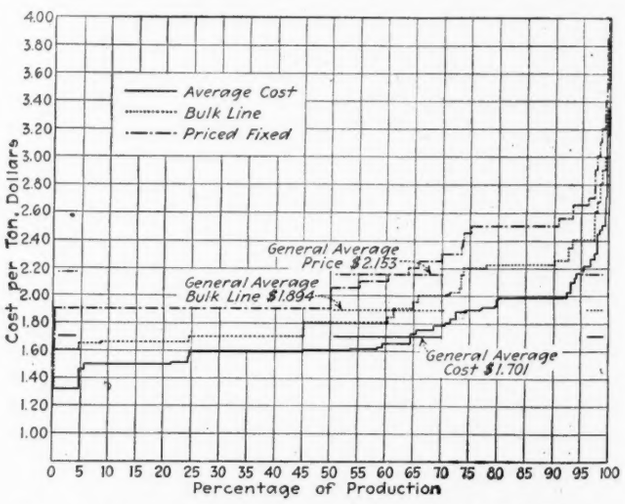


FIG. 5. AVERAGE COSTS, "BULK LINES" AND PRICES FOR ALL DISTRICTS

per cent. of the total output of bituminous coal for the period stated.

The costs for each district, in the proportion of its output to the total tonnage studied, are shown in full lines; the "bulk lines" are shown by dotted lines; and the prices fixed are indicated by dot-dash lines. The diagram also shows the weighted average costs, "bulk lines," and prices fixed for the tonnage included, and effectively disposes of the widely circulated aspersions of profiteering, of which the industry has been so freely accused by people having no knowledge of the facts or willfully misrepresenting them.

The weighted average margin between costs and fixed prices for practically the entire bituminous coal production of the country is but 45.6c., and between the "bulk line," which represents the higher-cost necessary coal.

and the price fixed by the Fuel Administrator of but 26c. When it is known that the capital invested per ton of yearly output ranges from $2 to nearly $8, and that the items above noted, which amount to a considerable sum per ton mined, must come out of this very narrow margin, it is evident that the coal business of the country is not only not on a profiteering basis, but is still on a very narrow margin of profit.

The average cost of the 84 per cent. of the total coal represented for the two months of August and September, 1917, was reported to be $1.696. The adjustments heretofore described raised this reported cost to $1.706, a very strong indorsement of the honesty of the reports made by the operators.

The average "bulk line" was fixed at $1.902, or 19.6c. above the average adjusted cost. This represents the

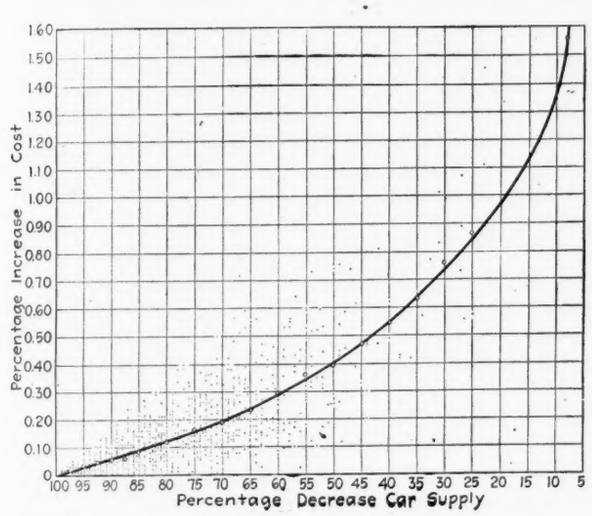


FIG. 6. INCREASE IN TOTAL COST OF PRODUCTION

margin required to assure the mining of the necessary coal, as compared with the average cost, which, of course, involves the mining of only coal up to or below the average cost; in other words, half the available output.

The weighted average of all prices fixed is $2.162 per ton and the average margin above the "bulk line" is 26c., representing all the above mentioned charges and all profit for the higher-cost necessary mines; the margin above the average weighted cost for the whole country is 45.6c. per ton, which, compared with profits in other businesses, certainly does not show any signs of profiteering in the coal business as a whole. The prices fixed are also sufficient, on the basis of the reported costs, to permit the mining of 98.4 per cent. of all available coal, without loss.

The prices fixed from this complete investigation of costs have shown, in many cases, a remarkable compliance with economic laws. For instance, in Illinois the cost of coal from the different price districts, delivered in Chicago, is found to be practically identical, showing that the mining of the higher-cost coal is due to its proximity to the principal market and the lower resulting transportation costs. High-grade coal shipped by lake and rail to Minneapolis was found to cost precisely the same per heat unit as a lower-grade coal shipped a much less distance all rail.

Special Prices.—The price fixing program adopted is expected to take care of all normal mining conditions and to permit the operation, with a reasonble profit, of all mines necessary to the country under war conditions. There are cases, however, of old established mines which are producing coal of a quality specially suited to certain processes or requirements, which coal, while produced at a cost materially above the regional "bulk line," is necessary and has always commanded a special price. In these cases, a higher price, sufficient to permit operation, is usually granted. Also, in some cases, groups of small mines, not required to report, are found to be serving certain communities at prices below other coal available, considering the transportation charges, but with costs above the regional "bulk line." These also receive special prices. In general, it is the policy of the Fuel Administration to encourage the operators to produce all coal needed and to place restrictions only on coal mined under conditions notably uneconomic.

Effect of Short Time.—While it is a syllogism in mining regions that "short time means increased costs," but little actual information as to the quantitative effect of lost time on the cost of coal mining is available. In the discussion as to the advantages or disadvantages of an even car supply to all mines, as compared with 100 per cent. supply to some and the remainder to the others, it developed upon the committee to determine, at least approximately, the effect of lost time on mining cost.

Reports from 73 Operators Were Analyzed

Fortunately reports were available from 73 operators in the New River district of West Virginia, which had been made out and submitted by an eminent firm of expert accountants for each month of the year 1917. Each of these was carefully analyzed, and the percentage increase of cost for each of the 830 observations thus obtained was platted; weighted averages were then taken at each 2.5 per cent. from 70 to 100 per cent. working time, and for each 5 per cent. below 80 per cent. The result of this study is submitted on diagram No. 6 which has been checked by numerous observations from practically every field, and has been found, within reasonable limits, to be correct. This diagram can be and has been used in reducing to normal cost the reported costs of collieries shut down during parts of months.

Anthracite prices were fixed by the President on Aug. 23, 1917, and have not since been revised. The latter is now a subject of intensive study, and it is expected that after sufficient data have been accumulated a revision and scientific price fixing will be attempted.

The problem of anthracite price fixing presents all the difficulties encountered in the bituminous fields, complicated beyond measure by the varying percentages of sizes produced by different mines in the same region, and the still more widely varying percentage of sizes produced by the different regions.

It should be generally known that the United States Fuel Administration exists only for war conditions. It expires by limitation of the Lever Act. The Administration is endeavoring most earnestly to give both to the miners and to the consuming public a fair deal and no favor. It has accomplished incredible results in conservation of fuel and stimulation of output, but such results have only been possible by the earnest, whole hearted, and patriotic support freely given by operators, miners, and by the consuming public.

DEPARTMENT OF HUMAN INTEREST

Using Posters to Boost Coal Tonnage

To stimulate the mine workers to produce a greater tonnage the anthracite producing companies have had recourse to big poster cards 20 x 30 in., printed with scarehead type and placed in the most conspicuous places in and about the mines, so that mine workers will not fail to see and read them. A poster put up by the Lehigh Coal and Navigation Co. on all its properties reads as follows:

Hit the Hun

Our mine output for
August, 1918, was 370,000 tons
August, 1917, was 392,000 tons

A loss
amounting to 22,000 tons

1 ton of coal makes 40
3-in. shells. In August

We lost 880,000 Shells

To back up our boys
"over there"

Let us make it up in September

A record tonnage means
a wallop at the Kaiser

Speed up September

L. C. & N. Co.

Other authorities declare that one ton of coal will manufacture only 27 three-inch shells but, more or less, the figure is startling whether you write it as 880,000 or 594,000, remembering as we must that a shell might well destroy a man who living might take the life of one of our boys "over there." These poster cards are well calculated to keep ever before the mine worker the tremendous importance of the work which lies before him and the part he has in the winning of the war.

All Kinds of Patriotic Work at Gary

The annual inspection of the gardens and yards of the employees of the United States Coal and Coke Co. at Gary, McDowell County, West Virginia, was made July 29, 30 and 31. The judges were Professor W. Paddock, head of the Horticulture Department, Ohio State University, Professor Dee Crane, representing West Virginia University, and Bert E. Sayre, representing the West Virginia Department of Agriculture. The judges found the gardens as a whole very productive. Many of these gardens had been planted under difficult circumstances, some being on ground that had been filled around newly constructed houses.

At one plant the garden of an Italian coal loader was found on an almost perpendicular hillside, the ground having been terraced laboriously as is customary in such cases in Europe. This man had about 25 varieties of vegetables in his garden, and yet he had worked every day at his occupation of coal loading. In another garden they found 600 newly planted grape vines methodically set out and properly staked. Interspersed between the vines were planted tomatoes, cabbage and other vegetables. At some of the plants all the yards had been used for gardens. The judges estimated that the gardens at the plants of the United States Coal and Coke Co. would bring at current market prices between $100,000 and $150,000.

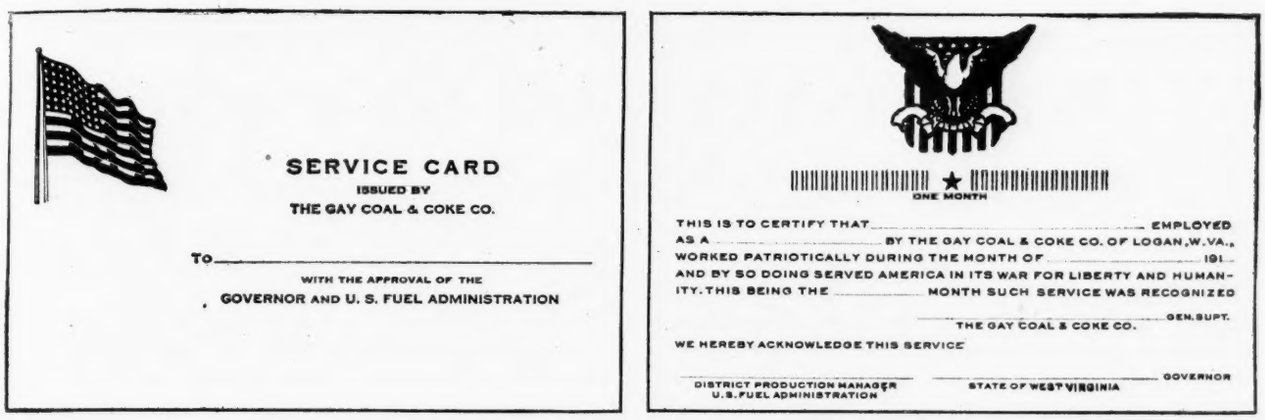
The employees of the United States Coal and Coke Co. have shown their patriotism in every call the government has made upon them: Red Cross work, Liberty Bonds and Y. M. C. A. work; and this inspection shows that they have likewise done their part in raising food supplies.

Reward for Patriotism in West Virginia

The Gay Coal and Coke Co., at Logan, W. Va., is issuing a four-page "Semi-Monthly Bulletin" for its employees. It is a pleasure to quote the remarks on "Service Cards" in its first issue, which appeared Aug. 31, 1918.

"Employees who render patriotic service by working full time each month will be awarded by the company with a service card certifying to that fact. This card will be approved by the general superintendent of the company and signed by Governor Cornwell and by the production manager of the United States Fuel Administration. Cards will be issued each month. Your first month's card will bear one star, the second month two stars and the third month three stars. The service, however, must be rendered in consecutive months; that is, to secure a card with three stars it will be necessary to have worked three months full time in succession.

"If an employee cannot work every day it does not mean that he will be deprived of a card. For instance: Should you desire to lay off a day or two for personal reasons, secure permission from your foreman or boss,



ENVELOPE AND SERVICE CARD ISSUED BY THE GAY COAL AND COKE CO.

who will issue you a written excuse. In doing this you will enable him to find someone to take your place without the production of the mine being curtailed. Should no cars be received and you report for duty and cannot work, it will be assumed, in keeping the record of your service, that you worked a full day. If you are compelled to lose time through reason of any fault not your own (that is to say, through any fault of the company in not furnishing you with work) you will be considered as having worked that day.

"In case of sickness, the company doctor or other practicing physician will furnish an excuse in writing, a copy being retained by the foreman or boss issuing it and a second copy being filed in the payroll office. This system with your own help will enable you to have a perfectly clean record each month. The value of these service cards cannot well be overestimated.

"Should you desire to leave the service of the company and apply to someone else for employment you could show a recommendation of weight and value. Should one of your friends come back from 'Over There' you could show him with pride that while he was doing his part you were doing yours. On the last page of *The Bulletin* issued for the first half of each month will appear the names of those who are entitled to service cards for the preceding month."

Some important directions to be observed after an explosion are as follows: Keep all air compressors working; if they are not working, start them, so that fresh air can be forced into the mine workings. Shut off all electric power entering the mine, unless this power is on a separate circuit entering a shaft or borehole to drive a ventilating fan. Do this in order to prevent any live men or the men who may come in contact with the electric wire from being electrocuted, and to prevent a fire or explosion through the short circuiting of any wires that may have been blown down.—*Rescue and Recovery Operations in Mines.*

STICK TO YOUR JOB

Written expressly for Coal Age

By RUFUS T. STROHM

You watched your pals as they marched away
To the snare-drum's martial rattle;
Your heart grew sick at the thought that they
Would strive in the heat of battle
While you held off, like a yellow cur,
Apart from the noise and bustle;
But such a thought is a baseless slur—
Stick close to your job, and hustle!

Let others dare where the star-shell's flare
Turns night into daylight glowing;
You're needed here, if the vast affair
Of war is to keep a-going.
The force that wins to the long-sought goal
Depends on the iron muscle
Of those who delve for the nation's coal,
So stay on the job, and hustle!

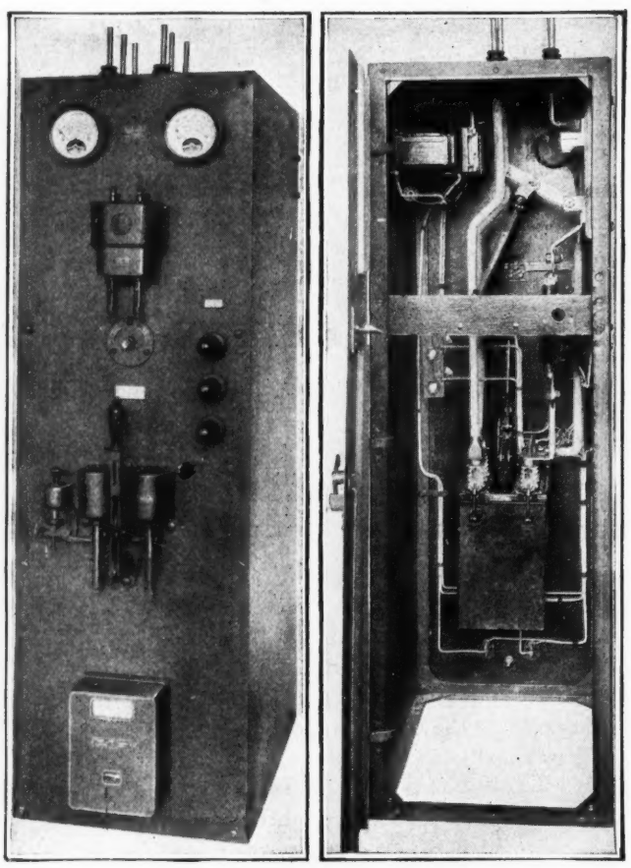
Shoot down the coal in a black cascade,
For that is the kind of shooting
That pays old Fritz for his every raid,
His lies and his savage looting;
And don't lament that you're left behind,
Denied a part in the tussle,
For winning hangs on the coal that's mined,
So cling to your job, and hustle!

Since coal is the mainspring of the war,
And you are a loyal miner,
Advance the cause we are fighting for,
Than which there is nothing finer;
Forget your dream of a far-off coast,
And death where the wheat-stalks rustle,
And give your help where it counts for most—
Stay right on the job and hustle!

NEW APPARATUS AND EQUIPMENT

Steel Switching Cabinet

The steel switching cabinet shown in the accompanying illustration is a unit made for single-, quarter- and three-phase circuits in capacities up to 300 amp. at 15,000 volts, and 800 amp. at 600 volts. All current-carrying parts are inclosed, and provision is made for bringing the leads out at top, bottom or sides of the unit. The cabinet consists primarily of instrument transformers, oil circuit breakers and disconnecting switches inclosed in a sheet-steel compartment with instruments, operating levers, etc., mounted on the sheet-steel front.



CLOSED AND OPEN VIEWS OF STEEL SWITCHING CABINET

The main switching apparatus consists of a standard switchboard-type oil circuit breaker operated in the ordinary manner. The oil circuit breaker is mechanically interlocked with the disconnecting switch so that this switch cannot be opened or closed while the oil circuit breaker is closed. The disconnecting switch is operated by means of a special handle or wrench from the front of the panel, and is so interlocked that the rear door cannot be opened while the switch is closed, nor can the switch be closed while the door is open.

This apparatus has been designed for use as distribution and tying in switches, as control switches for induction and synchronous motors, etc. It is usually mounted as a single unit but may be installed in groups if desired. When made with a drip roof the switching cabinet is particularly adapted to use in mines or other damp places. It can be made nearly water, gas and dust proof. It can also be used to control large motors in steel and cement mills, pumping plants, etc., where conditions often exist which cause the switching apparatus to become damaged or to be put out of service by dust, moisture and chains from traveling cranes.

Conveyors Replace Common Labor

Nowhere in the industrial fabric has the disturbance brought on by war conditions been more keenly felt than in the unskilled labor market—among the shovelers, lifters and movers of goods and materials. Perhaps because this type of labor had always been plentiful and relatively cheap there had been, before the war, less application of machinery to such purposes than in almost any other field.

Ore docks, coal docks, grain elevators and some large plants were equipped with complete and well arranged conveyor systems. But unless large quantities of material were handled in a highly organized way, it was the custom to depend on human labor using primitive equipment. Retail coal yards, factory power plants and construction jobs were examples of undertakings where it would long ago have been practical to install mechanical handling of materials, and where human labor was usually exclusively depended upon.

War conditions undermined old methods from two directions. Transportation became uncertain and made it essential to receive material in the largest possible quantities whenever transportation was available and to store it until it could be used. It was no longer possible to depend on shipments arriving at the plant in such regular sequence that coal or other materials could be unloaded from the cars for immediate use.

This situation aroused more interest in light, portable material-handling machines than ever had been felt before. It became an established principle with many companies not only to replace labor by machinery whenever the machine could do the work cheaper, but to give preference to the machine if the costs were the same or even slightly higher.

Conditions were ripe for the rapid application of light, portable conveyors to all sorts of handling problems. A grade of engineering skill and manufacturing ability was attracted to their production that had not previously been devoted to them. Light, strong, well-designed portable conveyors, economical of power, easily moved about and set up, made their appearance. These are adapted to handling coal, sand, gravel, ashes, salt chemicals, package goods, brick and stone.

They were designed and built in standardized sections that could be assembled in units of any length to meet varying requirements. This made it practical to carry at factory for prompt shipment a large stock—and held down the investment tied up in such a stock to reasonable proportions.

Such portable belt conveyors elevate as well as move material and so have made it possible to use more fully the storage space available. Without additional cost material can be piled to the top of a warehouse or a coal shed, while on the open ground higher and more compact piling of material is possible. Additional construction of storage buildings can in this way often be avoided.

In the service of the Western United Gas and Electric Co. at its plant in Joliet, Ill., two portable belt conveyors made by the Barber-Greene Company, of Aurora, Ill., are operated in series in loading coke into railway cars. These cars are loaded in from two to four hours, according to size and type, with less than half the labor that was previously required to load them in from 7 to 10 hours. The saving in cost is about 50 per cent.

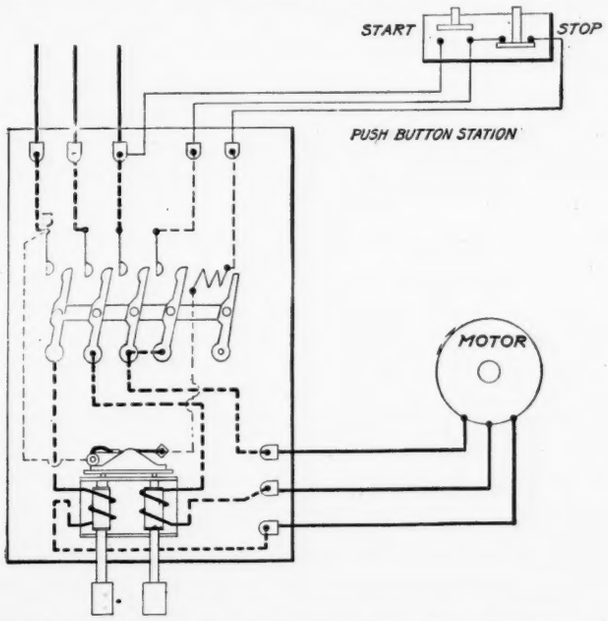
VIEW OF LIGHT CONVEYOR AT WORK

Several types of conveyors have been developed to meet different requirements by the Barber-Greene Company. For elevating at angles under 25 deg. a plain belt is employed. For angles of 30 to 35 deg. a belt equipped with steel flights is provided to prevent the material from slipping down the grade. For chemicals that will corrode metal, conveyors of similar design are provided with wooden frames. The conveyors are made portable by mounting them on a wheeled truck or suspending them from a trolley attached to an overhead steel cable.

A wide variety of applications have been worked out since these machines went into use—many of them unforeseen until they were discovered in practical operation. They unload cars into piles, into storage sheds, into wagons or motor trucks. They load cars from trucks or wagons, storage piles or sheds. Where the carry is long two or more conveyors can be worked in combination—sometimes with a chute between them.

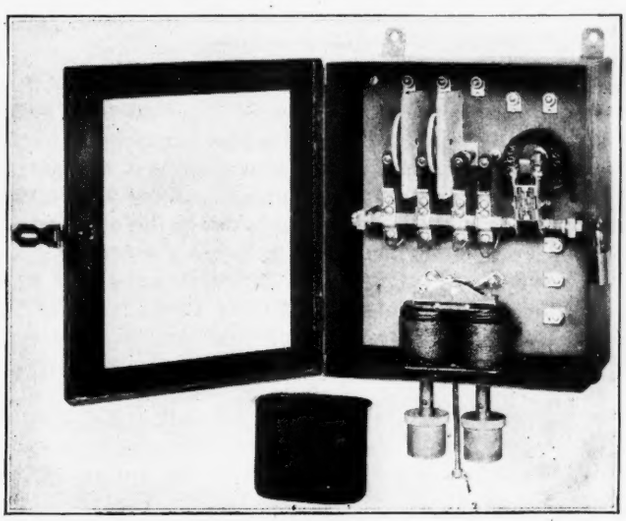
Remote-Control Starters

There has always been a demand for a device for starting small induction motors from remote points by throwing them directly across the line. The General Electric Co. has recently developed and placed upon the market such a starter, known as the CR-7006 remote-control switch, arranged for push-button control. This starter is applicable for use with motors up to and including 5 hp., 110 volts, and 7½ hp., 220, 440 and 550 volts. In addition to its starting function the device provides protection against undervoltage and overload. The device consists of a 25-amp., three-pole contactor with two inverse, time-limit, gravity-reset, overload relays mounted on a slate base totally inclosed in a strong sheet-iron case. A small "start and stop" push-button station is used as a remote-control switch. Completion



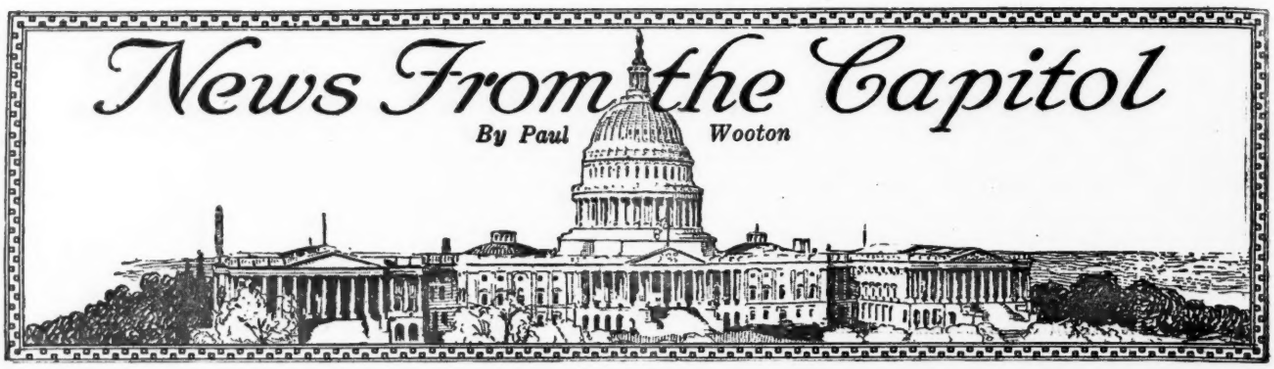
WIRING DIAGRAM OF REMOTE-CONTROL STARTER

of the starting circuit, by pressing the "start" button, energizes the coil of the magnetically operated switch, closing the contacts, which throws the motor directly on the line. Interruption of the circuit or a radical decrease in voltage permits the contacts to reopen by gravity, thus stopping the motor, which cannot start again until the "start" button is pressed.



REMOTE-CONTROL SWITCH OPERATED BY PUSH BUTTON

The overload relays can be adjusted for various values ranging from normal up to 50 per cent. above normal. They can also be adjusted over a wide range of time values. The relay trips automatically and resets by gravity. The cover of the inclosing case is furnished with a hasp so that if desired it can be locked in a closed position by a padlock.



New Prices Authorized for Certain Mines

New prices have been authorized for the Montevallo Mining Co., of Alabama, as follows: Run-of-mine, $3.65; prepared sizes, $3.90; slack or screenings, $3.15.

New prices have been authorized for coal produced by the Loony Creek Coal Co. and by the Reliance Coal and Coke Co., each of Kentucky, as follows: Run-of-mine, $2.55; prepared sizes, $2.80; slack or screenings, $2.30.

Owing to the unusual expense required in the stripping operation of the Graff Mining Co. in Westmoreland County, Pennsylvania, the Fuel Administration has allowed a price of $2.95 for run-of-mine, prepared sizes, or screenings. No addition is to be made for the wage agreement.

New Prices for Colorado Gas Coke

New prices for gas coke in Colorado have been established as follows: Run-of-retort, $5.50; run-of-retort, screened, over ¾ in., $6; prepared sizes above ¾ in., $6.50; prepared sizes below ¾ in., $4.50. The price at Colorado Springs may be 50c. in excess of those mentioned.

Stops Issuance of Distributors Licenses

An increase of 200 per cent. in the number of coal and coke distributors during the past seven months has caused the Fuel Administration to suspend the issuance of licenses pending an investigation. Some are of the opinion that advantage is being taken of the purchasing agent's commission and distributors are embarking in the business to contribute neither skill, experience nor anything else of value.

To Study Cargo and Coal Handling Methods at American Ports

New cargo and bunker coal handling machinery or new adaptations of the machinery now being used at the ports is considered by the Port and Harbor Facilities Commission the most likely means of cutting down a ship's "turnover." The active ports of the Old World have developed many of these devices, some of which are of American invention, and it is due to them that the capacity of the port is increased and cargoes handled quickly and cheaply.

"We want to make our ports as efficient as any in the world," says a statement issued by the committee. "We want to benefit by the experience abroad. We want to bring the standard of efficiency for machinery for handling general cargo and bunker coal up to the standard reached by the ore and coal handling machinery of the Great Lakes and elsewhere in the United States which is of American invention and admittedly the most efficient in the world.

"American manufacturers have been invited by the Port and Harbor Facilities Commission to make a careful study of our entire port situation to the end that possible new and ingenious methods of handling cargo and coal may be developed in conjunction with the best arrangement of piers, warehouses and other terminal facilities.

"Improvements, particularly in machinery, are desired now not only to expedite the movements of supplies to our armies in France, but also to have our mercantile marine ready to meet the keen competition that will follow after the war."

Price Fixed on Reclaimed Coke

A price of $5.50 has been authorized for mixed sizes of screened and cleaned beehive or byproduct coke reclaimed at the point of production from accumulated breeze piles. Such business, however, must be conducted under permit.

Production Quotas Now Being Assigned

Actual assignment of production quotas has been begun by the director of production for the Fuel Administration. Eventually each mine in the United States will have a rating and, as Dr. Garfield puts it, "individual responsibility." The enterprise of James S. Amend, the production manager for the Greensburg-Westmoreland district, is credited for making possible thus early the assignment of quotas in that district. When the rating of the mine has been established, the following letter from the director of production is sent to the operator:

After careful investigation it has been decided that your mine can produce at least ——— tons per day, and that tonnage has been allotted to you. It will be necessary for you to produce an average daily tonnage of ——— in order that you may contribute your fair share of the total coal tonnage needed by the United States Government in carrying out its war program.

The total coal requirements are definitely known and this has been allotted to the various producing districts and to each mine in each district. From this you will see that if the total amount is to be produced it is essential that no mine fail to meet that part of the Government requirement allotted to it. You will please make this situation known to your operating officers and to the mine workers in your employ, telling them that the United States Government looks to them in full confidence that they will accept the allotment of ——— tons per day as their fair share and

will cheerfully see to it that at least that amount is produced without fail.

Unless a sufficient tonnage of coal is produced it will be impossible for the United States Government to furnish to General Pershing material in sufficient quantities to enable him to carry on a successful campaign against our enemies with the smallest possible loss of life and labor. I have no doubt that every man and boy in your employ will gladly do his part and will rejoice in having this opportunity to contribute toward winning the great war which is being waged for democracy.

Plans to Increase Coke Production

In response to an appeal from the War Industries Board for more coke, the Fuel Administration is launching a campaign looking to the increase of that important material in the making of steel. Steel requirements are millions of tons above the present output. The limiting factor is pig iron, and in the making of pig iron coke is the essential holding back output.

A hasty survey of the situation shows a great deal of idleness among coke workers. A material increase in coke production can be obtained if the required labor can be secured. Comparatively little attention has been given the matter of idleness among coke workers. If the methods now being used so successfully among coal miners are applied to coke workers, it is believed that a marked increase in coke production will result. James B. Neale, who is in charge of production for the Fuel Administration, is directing the new campaign.

Will Rehabilitate French Coal Mines

Much of the material which will be necessary for rehabilitating the coal mines in the Lens region of France will be supplied by the United States. Plans to this end were almost perfected more than a year ago when the recovery of the coal fields seemed imminent. Officials of the War Industries Board, the Fuel Administration, the Bureau of Mines and the French War Mission already are busy on the problems involved.

More Coal Cars Being Loaded This Year

From Jan. 1, 1918, to Sept. 28 there had been loaded 641,761 cars of coal more than in the same period of 1917, according to the Railroad Administration. A summary of the loading of coal for the week ended Sept. 21 is as follows:

	1918	1917
Total cars bituminous	219,925	182,565
Total cars anthracite	36,859	37,294
Total cars lignite	4,056	3,379
Grand total cars all coal	260,840	223,238

A summary of reports for the week ended September 28, 1918, based on actual reports from most roads, but with the results of some roads estimated, follows:

	1918	1917
Total cars bituminous	226,238	191,185
Total cars anthracite	40,524	42,008
Total cars lignite	4,016	3,647
Grand total cars all coal	270,778	236,840

A drive is being made by the Forest Service, now that crops are out of the way, to stimulate the cutting of wood by farmers. It is pointed out that the heating value of one standard cord of well seasoned hard wood is equal to a ton of anthracite coal.

Summary of Traffic Conditions

Reporting to the Railroad Administration, the Fuel Administration summarizes traffic conditions as follows: "Car supply uniformly good in the East. Some accumulation on Baltimore & Ohio and need of power on Chesapeake & Ohio.

"Tidewater—Vessel supply ample.

"Lake Situation—Good, ample supply of coal at docks and dumping increased.

"Southern Region—Some car shortage in Birmingham district and in southwest Virginia.

"Coke—Car supply good."

Coal and Coke in 1917

The production of bituminous coal in 1917 was 551,790,563 net tons, an increase over 1916 of 49,270,881 tons, or nearly 10 per cent., according to C. E. Lesher, of the United States Geological Survey, Department of the Interior.

The production of Pennsylvania anthracite in 1917 established a new high record of 99,611,811 net tons (88,939,117 gross tons), exceeding that in 1916 by 12,033,318 net tons, or nearly 14 per cent., and surpassing the previous record of 91,524,922 net tons in 1913. With the exception of West Virginia all the large coal-producing states recorded increases, the only decreases having been in West Virginia (0.02 per cent.), Oregon, South Dakota and Georgia.

The production of coke in 1917 was 55,606,828 tons, an increase compared with 1916 of 1,073,243 tons, or 2.0 per cent. The output of byproduct coke increased from 19,069,361 tons in 1916 to 22,439,280 tons in 1917 and represented 40.4 per cent. of the total in 1917 against 35 per cent. of the total in 1916. The production of beehive coke decreased from 35,464,224 tons in 1916 to 33,067,548 tons in 1917. The number of active byproduct ovens increased from 6607 in 1916 to 7298 in 1917, and of beehive ovens from 65,605 to 68,687, but the irregularity of operation of beehive ovens in 1917, due principally to lack of railroad cars, reduced the average production per oven.

The number of men engaged in producing bituminous coal increased from 561,102 in 1916 to 603,143 in 1917, and the number producing anthracite decreased from 159,869 in 1916 to 154,174 in 1917. However, the number of men employed underground in the production of bituminous coal increased from 474,244 in 1916 to 498,185 in 1917, a gain of but 5 per cent. compared with a gain of 20.8 per cent. in surface employees.

In the anthracite regions the number of underground employees decreased 5.8 per cent., but the surface employees increased 2.4 per cent. In both branches of the coal-mining industry there was a relatively large gain in the number of men employed on the surface, which is significant when it is realized that it is the underground worker who actually produces the coal and who is the more skilled workman.

The average number of days worked in both bituminous coal fields and anthracite mines was the highest recorded—243 in the bituminous field and 285 in the anthracite.

A bond slacker is the Kaiser's backer.

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

The mine workers of the anthracite region were promised on Oct. 5 that an announcement would be made Oct. 15 relative to a change in scale. However, on going to press no such notice had been made. It is understood that there will be an increase, the amount of which will be announced Oct. 17, the date of this issue. The increase will bring the anthracite wage scale closer to the scale of the bituminous region. This gives substantial justice at this time as between the two regions, but it will give the anthracite worker by far the greater earning power, just as soon as the bituminous mines drop back, after the war, to their old-time desultory schedule of operation.

> One of the things that my father used to teach me when I was a boy was that it was not advisable to be honest solely because honesty was the best policy, but that it was advisable to be honest because honesty is right. And so it is with contract obligations, it is advisable to live up to your contracts not so much because you benefit from living up to them, although that has been the result, as it is essential that you should live up to them because living up to them is right.—*Secretary of Labor Wilson in reference to the wage increase asked in anthracite region.*

The anthracite region works steadily now and has done so for years. Everything, except perhaps the introduction of byproduct coal and carbocoal, seems to assure the continuance of steady work in the anthracite region. In fact it is likely to become increasingly steady as the years pass. Consequently the wage scale in the anthracite region, though based on the bituminous region and the short time its men work, will afford higher monthly wages than the wage scale of the bituminous region.

Yet it is likely that few will move into the anthracite mines. The evil apprenticeship rule keeps away the men from other sections. Many of the miners in the anthracite regions are foreigners and of peasant origin. No American wants to work as a laborer for such men, doing all the hard work and carrying off only a modicum of the pay. In fact the situation in the anthracite region is unbearably un-American and so long as the condition continues only immigrants will be found willing to fit themselves into it.

The mine workers in the anthracite region have shown that the increase in wage is not really needed by all of them for the maintenance of comfortable living. Of late it has been hard to get some of them to work steadily. At the plant of the Lytle Coal Co., near Minersville, the record of one month showed a loss of over 400 shifts. Most of these were lost by certain men who were absent from work day after day.

The complaint regarding the low wage is chiefly from the day workers who are not by any means as generously dealt with as the contract miners. The conference which will decide on the scale has been in session since Oct. 3. The union decided to ask for the increase on Aug. 16 and presented their request to Mr. Garfield on Aug. 22.

In Dubois, a leading town in the Clearfield district, a meeting was held Oct. 4 at which brewers and wholesale liquor dealers of the district promised the representatives of the Fuel Administration, there present, that they would not ship liquor into dry areas. The liquor dealers and brewers agreed to sell only to those persons who were known to them. The speakeasy evil is to be broken up. The day before the conference, Oct. 2, the retail liquor dealers made a promise similar to the pledge made by the wholesalers and brewers. The Fuel Administration has determined to try and put restrictions such as these in operation all over the United States and thus cure a loss of production from inebriety which is said to amount to from 5 to 9 per cent. of the whole production.

In the Butler-Mercer field the men have shown their loyalty, not only by an increased production but by undertaking to work full time. F. B. Reimann, production manager for his district, which includes all northwestern Pennsylvania, reports that at a mass meeting of the mine workers of Zenith mines Nos. 1 and 2, under the presidency of William M. Kay, the following resolution was passed:

"In response to President Wilson's appeal to the American miners to do everything in their power to increase the production of coal: We, the mine workers of Zenith mines No. 1 and No. 2 and of the new Victoria mine, in mass meeting assembled this 18th day of September, 1918, near Butler, Penn., do hereby pledge ourselves to work 50 full hours every week until the end of the war, unless prevented by causes beyond our control, and we hereby call on our fellow mine workers in the Butler-Mercer field to coöperate in making the production of this field 100 per cent."

In the Pittsburgh district Richard W. Gardiner, manager of production, is troubled by the fact that several local draft boards are exceeding their authority by placing miners in Class 1, thus causing them to be subject to immediate draft. He has been quite active also in his endeavor to prevent the miners from laying off for midday parades such as are being held on behalf of the Fourth Liberty Loan. These demonstrations of patriotic fervor should, he says, be delayed till 4 o'clock, at least, so that a full day's tonnage may be obtained, for unless we fulfill our duties as citizens we are not entitled to celebrate what we have done.

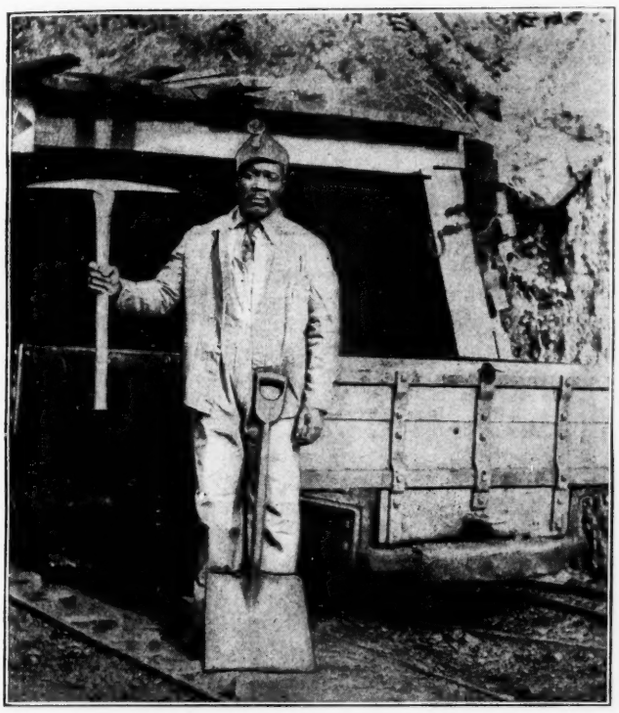
According to John Moore, the president of the United Mine Workers in Ohio, 100 out of 600 local unions report that the men comprising them bought about $726,000 worth of Third Liberty Bonds and had early in October purchased $432,319 worth of War Savings Stamps.

At Logan, W. Va., medals are being distributed to "industrial soldiers." A. C. Clapperton, general superintendent of the Amherst Coal Co. at Amherstdale, wears one himself and says that 416 of his mine workers will each receive one also. A bronze bar will indicate that the worker has done his full share of work for one month; a silver bar will attest the same for the second month; a bronze bar will be added to show the same service during the third month, and, after the fourth month of faithful service, a silver bar will be added and so on. Thus a worker will be readily recognized as a "steady" if the bronze and silver bars appear in right number and in regular alternation.

During the first month of this arrangement only 4 men in the employ of the Amherst Coal Co. put in less than 38 hours a week. The car supply was regular, so this result was made easy. The company has a storage arrangement, a Brown hoist loading the coal into railroad cars as soon as they arrive. A car can be filled in 22 min. Storage is made easy by reason of a convenient rocky ledge over which the coal can be dumped. As the coal contains little sulphur, and apparently that sulphur not of the kind which starts fires spontaneously, there has been no trouble from the firing of the coal piles.

The medals cost the company only 38c. each but the cost of the bars should be added. The Amherstdale mine workers find in the company a liberal landlord and a generous coal sales agent. Coal is sold the men at $1 a load, the company losing from 50c. to 75c. a ton by each sale. The houses rent for $10 a month though similar houses in Logan would readily bring $25 to $40 a month.

The Low Ash Coal Co. of Crown, Logan County, West Virginia, has a "black diamond" who loads 26 tons of coal every day the mine is operated. Last June the mine worked only 19 days, and this man, John Howard, loaded 525 tons of coal or 27.63 tons per day. On one of these 19 days the superintendent was afraid that he could not load all the cars furnished and Howard straightened himself up and put 50 tons on the cars that day. His earnings



JOHN HOWARD, WHO LOADED 50 TONS IN ONE DAY

are going into Liberty Bonds. John Howard is a "regular fellow," be it known; he drives a Ford.

The Pocahontas district has been asked for 14 per cent. more coal monthly. It is called upon to deliver 2,000,000 tons during the month of October. Such a large tonnage has never before been mined in this field. At Glen Jean, Fayette County, on Sunday, Oct. 6, a large meeting of miners, foremen, superintendents, other mine officials and operators was held under the leadership of James B. Neale, the Director of Coal Production for the United States Fuel Administration. There were 10,000 persons present from all over the New River field. James B. Neale spoke, also P. B. Noyes, the Director of Coal Conservation, Governor John J. Cornwell, Trooper Scott, Sergeant Brown and Lieutenant Nelidow.

In Kentucky operators are complaining that the boards are exempting only those men who are rated as skilled laborers—motormen, machine men, electricians and the like. The operators have made an appeal urging that coal loaders, and men who shoot the coal, are, in a degree, skilled and should be granted deferred classification.

The Kentucky draft boards find that a large proportion of the population would normally be exempt and consequently are disposed to turn a deaf ear to the requests for exemption unless the men seeking such a privilege are more than usually essential and have a reputation for steady work and large production. The associations of companies represented at the meeting which made the protest to Major H. B. Rhodes, of Frankfort, Ky., and the State Draft Advisory Board, were the South Appalachian, the Harlan coal operators, the Tug River operators, the Northeastern Kentucky Association and the Harold coal operators. These companies mine the best coal of Kentucky, much of which is of transport and byproduct-oven quality. It is extremely essential that these producers be not unduly interfered with, as their product is essential for the most vital of war uses.

Spanish influenza has invaded many of the coal fields thus reducing production in the Cumberland-Piedmont districts of Maryland and in Virginia and West Virginia, some mines being wholly closed and some operated only part time. In these sections the production is estimated at 50 per cent. of normal owing to the action of this disease. In Tennessee, Kentucky and Alabama the week's tonnage ranged from 15 to 50 per cent. of normal.

Reports from Altoona were to the effect that the tonnage in the Central Pennsylvania district fell off 70,000 tons or more than 5 per cent. of maximum output. Even at that the production was considerably larger than last year. Virginia has sent Dr. Paul B. Barringer, who was for many years with the University of Virginia to Bluefield, and he will visit all the mines in Virginia adjacent to Bluefield. Governor Cornwell, of West Virginia, has sent a representative to confer with him.

Doctor Barringer found 18 cases at Pocahontas, and reports arrived from the Richlands district saying that at least one-third of the miners were ill with the disease. One death had resulted. Other cases were reported in the neighborhood of Honaker.

Unrest in Canadian Coal Fields

The miners in district No. 18 of the United Mine Workers of America are extremely restless and seem to want a strike regardless of cause. The sliding scale has removed the old complaint about the cost of living, for the wages now rise with the increasing commodity costs. But it is still possible to strike because of an alleged unsafe condition of the mines, and 1300 miners at Fernie, Michel and Coal Creek are doing this; and they propose to get out the rest of the district if they can.

William Sloan, the Minister of Mines, offered to appoint immediately, under Section 73 of the Coal Mines Regulation Act, a commission composed of three members, one chosen by the miners, one by the operators and a third by the lieutenant-governor in council on the recommendation of the Minister of Mines. This commission, if the proposal had been accepted, would have taken evidence at once relative to the mining dangers at Michel and Coal Creek for which a remedy is still to be sought. What recommendations they would have made would have been binding on everyone.

This constituted the first proposal. The second was that the Minister of Mines pledge himself to "introduce at the next session an amendment to the Coal Mines Regulation Act calling for the production of coal in only one shift in every 24 hours throughout the Province of British Columbia, except in case or cases of national emergency." The amendment was to become effective within one year after the conclusion of the war.

The proposal was telegraphed to Fernie and was voted on unfavorably by the representatives in secret ballot. The company was perfectly willing to accept the suggestion submitted, but as the men turned it down and continued on strike the matter continued just where it was.

Thomas Biggs and E. E. Brown, district president and secretary respectively, held a conference on Sept. 21 with the provincial cabinet. They agreed to recommend that the mine workers return to work for 30 days on the single-shift basis, while the questions at issue were decided. Even this failed to satisfy the men, and the strike continued. The Crow's Nest Pass Coal Co. assented to the arrangement, as it has to every other change suggested.

There seems to be nothing of a reactionary character about W. R. Wilson, the general manager. Working conditions have been improved, as the men were good enough to admit. Chemical analyses of the air made by the Burrell indicator show a reduction in the percentage of methane of from 25 to 75 per cent. These Burrell indicators have been introduced as a means of more careful determination of the methane content. The company has agreed not to extract more than 15 per cent. of the coal at first working. The coal dust has not only been sprinkled with water, but also with fine flue dust. Electric safety lamps have been introduced in place of flame safety lamps.

The Province of British Columbia also has been active in meeting the problem. It is preparing to adopt George Rice's recommendation for the appointment of a permanent commission to investigate the "bumps" in the mines.

The miners finally offered to go back to work if the principle of the single-shift were accepted for all mines, if places were found at once for as many as possible on single shift and if places were provided for all within 30 days. They did not want the matter arbitrated. On Sept. 25 they declared that if their offer was not accepted by the following day they would order out the firemen, pumpmen and fanmen, making the possibility of an early return to work impossible.

Mr. Sloan was not prepared to require that all mines be run single shift. He made the suggestion that No. 1 mine, Coal Creek, where most of the bumps have occurred, be given separate treatment. He said it might be closed down or worked 8 hours in every 24 hours.

Director Armstrong Concedes Everything

The Dominion Director of Coal Operations, W. H. Armstrong, finally took up the dispute and used all the wide powers which were given him when the strike was at its height a year ago. The mine workers expected a great deal from him, because when he was appointed he made a wage scale full of concessions. The mine workers like a potentate of this kind who can wind up their disputes by conceding all that they ask. W. H. Armstrong's action was to issue the following document on Sept. 27, 1918:

"A request has been received from miners employed at the mines of the Crow's Nest Pass Coal Co. Ltd., at Coal Creek and Michel, asking the adoption of a single shift in all the mines instead of a double shift as at present. This request is based on the allegation of the men that there is a dangerous condition of the mines due to working double shift.

"The question of the safety of the above mentioned mines is one that comes under the regulations of the Coal Mines Regulation Act of British Columbia and therefore comes within the jurisdiction of the Department of Mines of that province and not under the jurisdiction of the Director of Coal Operations.

"The issue as to whether or not the operation of those mines would be more dangerous on a double shift than on a single shift is one upon which the representatives of the men and the company disagree.

"However, in view of the difference of opinion which has developed I hereby instruct the Crow's Nest Pass Coal Co., Ltd., to install a single-shift system at their mines and will request the Minister of Mines of British Columbia to appoint a Royal Commission as proposed by him to determine the question at issue, the Commission to report without delay when the matter under dispute will again be reviewed.

"It is further understood that the single-shift system does not apply to development places nor to necessary repairs in the mines.

"By virtue of the authority vested in me by order of the Committee of the Privy Council, passed under the provisions of the War Measures Act of Canada, 1914, I hereby direct the foregoing conditions shall be in force and effect at the mines of the Crow's Nest Pass Coal Co., Ltd., until further notice."

But Everything Appears Not To Be Enough

But this decision of W. H. Armstrong was not sufficiently subservient to please the mine workers, who were utterly irresponsive to every appeal and had cast off the leadership of their union officials. Apparently they did not want to have any commission appointed to consider their demands, because they realized that they might not win out when the matter was considered.

On Sept. 30 the Gladstone local turned down the "order," for "order" it was. It could not be regarded as a "proposition," though the press so termed it. It will be noted that the company was ordered to work single shift, whereas the mine workers were not even requested to work. The law does not rest with even-handed strength on all parties in the Crow's Nest district. The mine workers are in an unreasonable mood. They demanded in June not only this single shift, but a 6-hour day. Moreover, they would not consent to three men working in a room, a plan which the company asserted would mean the gaining of 80 per cent. of their demands.

On Oct. 7, however, the Gladstone and Michel mine workers voted in favor of a return to work on the following day, thus ending this long-drawn-out and bitter strike.

Some people regard the bumps as not due to mining, but to natural movements of the earth's strata, the outcome of ill-balanced stresses in the structure of the earth. It is suggested that if the bumps are of that nature a warning might be obtained from a properly equipped seismographic station if installed nearby. It is said that F. Napier Denison, the official seismographer for the Dominion government, at Victoria, B. C., is about to establish such a station.

The region around Edmonton was formerly not unionized. Now that the union has been forced upon the operators the men do not know when they have asked enough. Some time ago they received word of the trouble at Fernie and were the first of all to telegraph their approval of the strike, and for a while it was thought that they meant to start the ball rolling with a strike in sympathy with the Fernie men.

Edmonton Strikes Must Be Fought Out

Though they have not come out on strike in sympathy with the Fernie men, some have been out on their own initiative. The 40 miners working at the Bell mine, Namao, Alta., of the Sturgeon Consolidated Collieries went on strike Sept. 16 asking for an increase in wages of 20c. a ton. Humberstone, Bush, Clover Bar, Twin City, McPeal and Dawson miners were already involved in strikes. The miners at the first of these mines, Humberstone, wanted an increase of 133 per cent.

Pictou County in Nova Scotia has had a bitter coal strike on hand. In case the reader may need some help in visualizing the location of this field, it may be said that this county faces on the north the eastern end of Prince Edward's Island, and the principal towns in the field are New Glasgow and Stellarton. The miners did not want a board of conciliation, and they opposed an increase based solely on the increased cost of living. They made demands and insisted that these demands be complied with.

They declared that this must be done at once. They were quite willing that provision be made that future increases be based on the increase in the cost of living, but the increase sought at this time, they said, must not be limited by any such consideration. No one seemed to have much hope that the trouble would soon be terminated.

Pictou County Mine Workers Go Back to Work

Charles A. Magrath, Canadian Fuel Controller, who, as noted in *Coal Age* on Sept. 26, page 618, has all kinds of powers granted him in Nova Scotia and New Brunswick, successfully turned the trick. He arrived on Sept. 25 and met the operators and operatives and soon offered the mine workers an increase of 20c. an hour, the same scale of wages as was accepted by the Dominion Coal Co.'s workmen in Cape Breton. The offer was retroactive from Sept. 1 and it will hold good for four months—till Jan. 1 of next year.

The miners' claim, that cost of living has been steadily mounting, was the cause of this short-time settlement. It is understood that a committee will study the cost of living and that a further increase in wage will be granted on Jan. 1 if the situation warrants it.

The balloting relative to this proposed settlement—inflicted on the operator and humbly requested of the mine worker after the manner of such settlements—approved of its terms. An overwhelming majority ratified it at Drummond, Acadia and Thorburn.

The miners of eastern British Columbia and parts of Alberta seem to have arrived at a point where nothing but resistance on the part of the operators and the federal officials will produce orderly conditions. Concessions merely provoke to further demands. In Pictou county the status is somewhat different.

Smother Him with Your Coal

EDITORIALS

Operator's Attitude to the Workingman

AS IT is usually hard to sell and easy to buy, the seller is suave and the buyer is grumpy. Meet the salesman in the evening, when he is a buyer of the board and lodging of "mine host," and he is a perfect bear. Nothing is right, and for nobody is there a good word. You could not imagine the pleasant salesman and the ill-tempered guest as the same man.

The relations between labor and capital resemble those between seller and buyer, but when labor is plentiful the capitalist is apt to greet applicants for work with a snarl, and when labor gets painfully scarce the reception it is accorded by capital is of the nature of a wheedling. Just now the operator is at the wheedling stage. It will not last long, in all probability, but perhaps it will last long enough for him to learn a little about the importance of the workingman as an employee and, impressed with that, he may realize the workingman's power as a voter.

As a matter of fact, to obtain the right attitude of labor to capital should be a matter of continued endeavor. The salesman always keeps the attitude of the client in mind. He knows that the reputation of his house must be above question, not only for fair dealing, but for courteous and even generous conduct. He realizes that the surest way of doing this is by personal acquaintance under especially favorable conditions. How industriously he stages such conditions and carefully watches his opportunity. The operator should try to get a similar standing with labor and should watch in like manner his opportunity for creating the right impression.

It certainly pays. A dozen corporations with a bad reputation for unfairness to labor could be mentioned. They have changed the personnel of their officials, but still the past remains to plague them. The better men have left and the less desirable men have remained, and the longer they stayed the more sour they became. The corporations in question have reformed, but they cannot get workmen from outside to see it; and they have to get along with what men they have.

If they do, by chance, bring in fresh men, it is like putting fresh milk into a bottle of soured cream. They sour also. A bad reputation is extremely hard to live down. It is far harder to bring a reputation up than to ruin a good reputation once formed. A company that has sold its men the bad goods of comfortless working conditions, poor ventilation, slow car service, high store prices, poor homes and unsympathetic management is already out of business. It has lost its trade and it can sell no longer.

By dealing solely with the flotsam and jetsam of society it may go on doing a little business, but it cannot deal with such people in the same manner as it would with the better class of men. It is trading with subnormal men, with the outcasts of other mining camps. A strong arm is necessary, and no one desires to come where such discipline is enforced. A convict camp is undesirable quarters because the rules have to be arbitrary and because the social surroundings are not pleasing. A village where a company has been unkindly has all the character of a convict camp, and continues to have it long after the management has changed for the better. The memories, the harsh judgments, the traditions of the old and evil times still hang around the very hills that hedge the plant.

Let us gather hints from the salesman and plan for good will and mutual understanding. The man who has a hard-luck story to relate about his men is like the man who regales you on the hotel porch with a story that the town you live in has the worst merchants and poorest stores in the state. It is a reflection of his own lack of success or of the poor line of his goods. He should keep his story to himself or leave town. So, likewise, with the operator who is always abusing his men. There is something wrong, of course; there is surely something wrong—with himself or his predecessors. It would be the better part of wisdom for him to say nothing.

Filling the Liberty Loan Quota

IN MINING and agricultural districts it is not difficult to fill the Liberty Loan quota. That is well shown by the fact that Iowa was the first to subscribe the required amount in the Fourth Liberty Loan drive and, in fact, managed to exceed it. Evidently the quota selected is not based on population, but on financial resources. New York City's five boroughs, for instance, are asked for $1,334,082,400. Assuming a population of 5,737,492 persons, which is the 1918 estimate of the Board of Vital Statistics of the Municipal Department of Health, this would mean a rating of $232.52 per person, earner and nonearner alike.

The rest of the United States would have to raise $4,665,917,600. The population of the United States outside of New York City may be put roughly at 100,000,000. Thus in the country outside New York City the per capita asked is $46.66. So the New York City per capita is about five times that of the rest of the country. If the village allotment were separated from the urban allotment, and the per capita of the former calculated, it would be found extremely low. What wonder then that it is easily raised!

If, however, there were no unequal Federal taxes it might, nevertheless, be easy for New York City and other urban centers to take the hurdle gracefully and near the head of the procession, for the urban sections are extremely enthusiastic in the winning of the war, having read extensively about it since the war began and at a time when the village dailies and weeklies treated the local news as more important than the news from the front.

But the cities have not only the larger quotas in the Liberty Loan, but the larger amount of taxation. If New York City is taxed only in like measure as it is asked to lend, it will have to supply $310.03 per capita this year for Federal taxes, whereas the rest of the country will supply only $62.21. Probably the difference is far greater.

No one is complaining, of course, but if the quota is hard to raise in New York City let not the rest of the country raise a clamor and talk confiscation of wealth; and if a village exceeds its quota let it not boast unless every earner in the village has bought a bond and unless the bonds that are bought are as large as each man or woman can hope to pay for in the next few months.

Elaborate charts have been prepared showing what each of us should subscribe if we do our part; but no one can really size up the duty of others without knowing their circumstances. The amount due from each of us is not a dollar less than the utmost we can spare by saving and scrimping day by day. If looking over our expenditures we cannot find a single thing that we have sacrificed, we cannot feel that we have done all that could have been done. If we have not worked at higher pressure since the war began, we have not done our part toward the greater production that the war demands.

Quotas are deceitful things. Every soldier does his utmost, bags as many Germans as he can, and, if he brings home a bigger bag than his file mate, he is back for more the next day nevertheless. The quota of each of us is the utmost that each of us can do. To all of us comes the counsel of this hour of trial: "Be an 'utmost' man."

Character of South Wales Coals

A QUESTION frequently asked by would-be coal exporters is, What is the analysis of the celebrated South Wales coal? People who hesitate to ask for the composite analysis of Illinois coal or the coal from Indiana, despite the relative similarity of the fuels in each of these states, regard it as quite easy to formulate an analysis that will represent closely the coal of South Wales. As a matter of fact, while the coals of the two states mentioned have quite a uniformity of fuel ratio, the coals of South Wales vary immensely.

Perhaps the range in Illinois coal is adequately represented by taking the analyses contained in Bulletins 22 and 85 of the United States Bureau of Mines. The extreme low value for fuel ratio to be obtained from these figures is that of the Shiloh (St. Clair County) coal, No. 8 Mine, No. 6 bed. The ratio is 0.8768. The extreme value is for a Carterville (Williamson County) coal, and is 2.0294. The range in Indiana may similarly be taken from the records to which reference has been made. The Rosedale coal in Parke County has a fuel ratio of 0.9964, whereas a sample of Dugger coal in Sullivan County has a fuel ratio of 1.4875.

Probably few realize that there is this amount of variation within the limit of these states, where uniformity of fuel ratio is the general rule. The higher ratio in Illinois is 2.31 times the lower ratio, while the relation between ratios in Indiana is 1.49. The coal in Indiana is more uniform in ratio than the coal in Illinois, though the variation in physical appearance is far greater, part of the coal in the former state being known as "block" coal and the other, strange to say, being called specifically "bituminous," though surely the block coal is every bit as bitiminous as the other.

It is common to regard the South Wales field as including all the coal area in South Wales and in Monmouthshire, though the latter county is in England. Monmouthshire is, however, populated mostly by Welshmen, and even the English people look upon the shire as a part and parcel of Wales. The report of the Royal Commission on Coal Supplies groups, under the South Wales field, the Forest of Dean and the Bristol and Somerset fields, as well as the South Wales and Monmouthshire field—but that is a purely geological assemblement and in what follows only South Wales and Monmouthshire are considered as forming South Wales, because this particular grouping accords best with popular practice. The coal progresses rapidly in its degree of carbonization as the western end of the field is approached, just as the carbonization of the Appalachian field increases as we approach its eastern edge.

But the Appalachian field is broken by an upheaval and erosion, whereas the Welsh field is almost continuous, the only break being one of about 15 miles between Carmarthenshire and Pembrokeshire. For this reason carbonization in South Wales is even more regularly progressive than in the United States, and fuel ratios of all kinds between the limits may be found. Perhaps these limits may be set between 2.246, the ratio of the Yankee seam, to 24.136, the ratio of the Cwmnant Graigola seam. This is a progression in which the highest term is 10.74 times the lowest. It will be seen that the variation in the degree of carbonization is far higher than in Illinois or Indiana. It will be readily understood, therefore, that if we would talk of South Wales coals in relation, at least, to fuel ratio and heating quality, we must specify with exactitude the location from which the coal comes; and even then we are not quite safe, so variant in fuel ratio is the South Wales coal.

So much for fuel ratio. As for sulphur, the percentage is always low. Figures to hand show that it varies between 0.05 and 2.41 per cent., though the latter figure is not representative as the sulphur percentage somewhat generally is below one, and averages 0.90 per cent. The ash percentage lies betwen 0.99 and 7.75 per cent. This last is an exceptionally high figure for South Wales coal, the average of forty records of samples in the article of F. R. Wadleigh, appearing in *Coal Age*, Feb. 8, 1913, being 2.74 per cent. In every case by ash is meant not ash plus sulphur, but ash alone.

Some of Mr. Wadleigh's authorities have added the ash and sulphur together and then quoted the sulphur separately. A correction has been made wherever the totals indicated the necessity for such revision. It must be remembered that the figures for South Wales are those given by operating concerns and may rather show the quality of the coal they are selling than the quality of the coal in the bed. The sampling is probably not as severe as that done by the United States Government. Nevertheless, if the figures given are really representative of South Wales coal as it arrives at the market, one is not surprised that it has such an excellent status wherever used.

DISCUSSION BY READERS

Wage Adjustment

Letter No. 1—In discussing, editorially, a definite and systematic way to adjust wages and other labor disputes, under the title "After-the-War Arrangements," *Coal Age* assumes a commendable attitude.

The subject of wage adjustment is not new; various schemes have been proposed, but no satisfactory solution has been reached. However, there exists today a better knowledge of the problem and progress has been made, so that we have good reason to believe that the solution is not remote and that a plan will soon be devised that will admit of no reasonable dispute.

Evidences of Remarkable Progress Made in Dealing With Labor Problems

No problem is of greater importance to the world's industries than the relation of employer to employee. In a paper read recently before the American Society of Mechanical Engineers, L. K. Comstock declares that the problem transcends in importance those of the war. In a most convincing fashion he asserts that, while little effort has been expended by either employer or employee to reach a solution for scientifically adjusting labor difficulties, there is evidence that gratifying progress has been made.

Whether belonging to the ranks of employer or employee, one should be able to approach the issue without prejudice or rancor. In the past distrust and vindictiveness have prevailed to an extent that strikes and lockouts have followed with disastrous results to both sides. Some years ago, I recall that a coal operator, replying to a request for a truce, said "I will fight until my toe nails drop off." A decade has now passed, and that man's representatives now sit in peaceful council with the representatives of the same employees, which is certainly evidence of definite progress.

The Passing of the Walking Delegate

Another evidence of progress is the growing scarcity of the walking delegate, who is invariably under the influence of the "long green." Instead, now, right and reason are being more generally recognized as the determining factors when disputes arise that threaten to destroy business or social affairs. Only recently, there appeared in Washington the officials of the United Mine Workers of America, who came to ask Fuel Administrator Garfield for the right to demand an increase in wages. Though the request was denied at the time, later Doctor Garfield took up the matter, in the interests of the hard-coal workers, and started an inquiry to establish the merits of their claim.

While some may regard this as a novel procedure, they will not deny that it is in direct line with the spirit of democracy, and is an endorsement of the sentiment pronounced by Viscount Bryce, in discussing war and progress. Mr. Bryce emphasized the power of development of reason as the guide of life and the chief source of human progress. He contrasted this with the less refined power of selfishness and of passion, which he stated were also elements of human action when social order and right is to be secured only by force.

Equilibrating Wages and Prices of Living Necessities

Referring to the statement in the editorial previously mentioned, that "wages under normal conditions determine prices," it is worthy of note that for years the Department of Labor, at Washington, has maintained an index system, to establish the rise and fall of commodity prices and wages and their relation to the price of gold. Similar indexes have been maintained for many years by the London Economist, London Statist, Bradstreets, Dun, Gibson, and others.

No argument is required to prove the truth that *wages must advance with the cost of living*, so that, as the editorial writer puts it, the "margin between price of product and cost of production will be unchanged by a change in wages." The index numbers arranged to govern the rise and fall of prices and wages and kept by different organizations prove the accuracy of the system, which fact should appeal to the employer and employee with equal force and lead them to adopt some similar method in settlement of their disputes.

The following is quoted from the Bulletin of the Bureau of Labor Statistics, No. 173, referring to the usefulness of index numbers in working out the solution to an intricate problem, such as the one under discussion, the bulletin of the Bureau of Labor Statistics No. 173 says:

> The first step in framing a clear idea of the ultimate use of the results of index numbers is most important since it affords the clue to guide the compilers through the labyrinth of subsequent choices. It is, however, the most frequently omitted. When the end in view is specific and capable of precise statement, the problem of choosing methods is comparatively simple. Straight-forward logic then determines what commodities should be included, what sources of quotations should be drawn from, and how the original data should be worked up to give the most significant results.

Urged by President Wilson as Imperative

The remarks of President Wilson, in addressing the American Federation of Labor, at Buffalo, go to show that in his opinion such a course or method is imperative. The following is quoted from his address:

> Now to stand together means that nobody must interrupt the process of our energy, if the interruption can possibly be avoided without the absolute invasion of freedom. To put it concretely that means this: Nobody has the right to stay the processer of labor until all the methods of conciliation and settlement have been exhausted, and I might as well say that I am not talking to you alone. You sometimes stop the courses of labor but there are others who do the same.

The conclusion is thus forced upon us that a formula for adjusting disturbing differences between employer and employed is being gradually but certainly reached,

and it is to be hoped that this will eliminate acrimonious discussions, which will be replaced by reason and science.

The difficulty of stabilizing wages appears to have been overcome by the United States Bureau of Labor by taking a period such as that from 1900 to 1909, inclusive. Commodity prices are averaged for the ten years of that period; referred to a base of 100. If the average of commodity prices in 3 per cent. higher for 1913, the index number will be plus 3 for that year or 103. A base or rate of wages is similarly established from the prevailing wages for that period.

STATEMENT OF LOUIS K. COMSTOCK BEFORE THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Quoting Mr. Comstock, further, on this theory, we have the following:

> This plan has the merit of immediate practicability. The means are at hand and the machinery already is in motion for giving it a trial; whereas the alternatives, which have at various times been suggested for regulation of prices by government for preventing commodity price increases by reason of the compensated dollar having a multiple standard of value, are not easy to try because they require legislative action following a vast amount of national education.

It is recognized, of course, that a method or system such as this, to be practical and effective, can only be developed after repeated efforts. There are elements entering the problem that are yet to be considered, such, for example, are the relation of different industries to the life of operatives, and the relation of that industry to the national development.

Other features will develop that can, no doubt, be taken care of as they arise. The application of the principles, in a practical way, however, is of primary importance, and it can be confidently expected that, not only will there be more satisfactory relations of employers to their employees, but the solution of problems relating to the speeding of industry, which is most pressing at the present time, will be greatly facilitated.

Sandy Run, Penn. W. E. JOYCE.

Blackdamp on Pitches

Letter No. 1—I have read carefully the inquiry of "Miner", *Coal Age*, Sept. 19, p. 568, and the answer given to his question, of whether it is possible for blackdamp to hang at the face of a chute place pitching 35 degrees.

Having had a similar experience with this so-called "blackdamp" hanging at the face of some chambers that were driven to the rise, like our friend, I too have been puzzled for a while, but came to the same conclusion as explained by the editor, who states that, owing to the mixture having a higher temperature than that of the air on the gangway, it hangs to the face of the pitch.

APPLYING THE TEMPERATURE TEST

In order, however, to satisfy myself that this was the reason and that the mixture, which would extinguish a light but showed no tendency to gravitate, was of a higher temperature, I took a thermometer into the mine and made a few tests. I found the temperature of the air on the gangway was 34 deg. F., while that of the mixture at the face of the pitch was 55 deg. F. Then I was satisfied that that was the reason it did not gravitate to the level of the road.

Allow me to add that I made a test of the effect of this mixture on the life of a tame canary and found, after exposing the bird to the mixture for three minutes, that it was none the worse for its experience. A short time after I repeated the test with the same bird, this time exposing it for ten minutes, and found that the bird then acted very weak and tired. While the mixture did not seem to bother the men who worked around it and in it all day, they were obliged, however, to use carbide lamps, in order to keep a light.

Later, an incident occurred that proved, beyond any doubt, that if the mixture had the same temperature as the air on the gangway it would fall to the bottom of the chute. Up to this time the district was ventilated by one of the first splits off the main intake and the air was quite cool. To improve the general circulation in the mine, the foreman now ordered the current reversed, which caused this district to be ventilated by the return of two gangways below. The result was that the air passing on the gangway had a much higher temperature than before the change was made. The mixture that previously hung at the face was now found on the floor, while a fresh current of air swept the face. Whether this blackdamp was being generated from the coal or where I do not know, but there was always more or less of it present in this district of the mine.

Plymouth, Penn. JOSEPH R. THOMAS.

Justice to the Miner

Letter No. 4—Kindly afford me space in the columns of *Coal Age* to reply to the query "What Is the Matter With the Miner?" which is the title of an article by A. H. Stow, Pocahontas, W. Va., appearing in the issue of Sept. 19, p. 539.

Mr. Stowe deplores the fact that the miner is neither taking advantage of the present situation to earn the wages that he might, nor doing his full part in increasing the production of coal to meet the present demand. These may be facts so far as the miner of Pocahontas is concerned but they do not obtain in Colorado, at least at any of the mines of The Colorado Fuel & Iron Co.

CONDITIONS IN COLORADO SAME AS IN WEST VIRGINIA

The same conditions exist here in respect to the location of mining camps in districts remote from the larger cities and, as stated by Mr. Stow, it is true that the miner does not have the same opportunity for amusement as the larger cities afford. He does, however, in most of the camps operated by this company, have an opportunity to spend his spare moments in profitable reading, or bowling, or playing pool and billiards in the Miners' Club House, operated by the Y. M. C. A.

Whether the living conditions and opportunities for recreation are better in Colorado than in West Virginia, I am unable to say. I do know, however, that our miners have responded nobly to the demands of the war, by working more diligently and producing a larger average daily tonnage than they did prior to the war, or prior to the present high scale of wages.

Let me say that I am inclined to the opinion that, in localities where this is not the case, the miner may not have been properly informed or appealed to by his company. The Colorado Fuel & Iron Co. took steps, early in the war, to keep their employees informed through reading matter given them and mass meetings held. The result is that we have been much gratified at the response our miners have made by working more steadily and producing larger tonnages. There has been no occasion when they have not responded after the situation has been made clear to them.

The company has also kept a record of the percentage of possible shifts worked, and have posted, at each mine, the figures showing the employees what their own record was for the preceding month, as well as the record of every other mine operated by the company. We believe that this plan has created some rivalry and stimulated production. The records for June, 1918, showed that 90.03 per cent. of the possible shifts were worked; for July, 92.71 per cent.; August, 92,78 per cent.; September, 95.46 per cent.

The Colorado Fuel & Iron Company's miners have also responded liberally to all war funds and bond issues.

In my opinion, coal miners are just as patriotic as any class of workmen in the country, and are just as anxious to do their part. However, they must depend to some extent on their employer to keep them informed as to what their duties really are and what is expected of them.

E. H. WEITZEL,
Pueblo, Colo. Manager Colorado Fuel & Iron Co.

Accounting of Materials

Letter No. 1—Observing the request of "Office Manager," *Coal Age*, Aug. 29, p. 417, for suggestions regarding the best methods to be employed in the accounting of mine supplies and materials, I beg to submit a few remarks based on my own experience in the handling of supplies at mines during the past fifteen years.

Now, more than ever before, when the prices of both labor and material are soaring, it is of the utmost importance that the company or owner should know where and for what purposes the money is expended. Labor and material are the chief factors in the operation of mines and as such require the strictest regulation.

First, then, it is necessary to have a good storehouse where all needed supplies and material can be kept on hand ready for immediate use when occasion requires, and where perishable goods and valuable material will be protected from the weather and from theft.

The storehouse and its entire contents should be in charge of a reliable and competent clerk or storekeeper, who must be held responsible for all material received and given out. To enable him to do this properly a stockbook must be provided. I am permitted to offer below a sample page form of stockbook used at our collieries. The form shown here is one of the pages designed for entering material ordered each month, such as track material, piping, shafting, etc. There are other pages similarly ruled, but designed for daily consumption of the numerous smaller items that are constantly being required. These include such articles as nails, bolts, oil, powder, tools, etc.

The daily posting of supplies given out is absolutely essential to the right conduct of a storehouse. The work of caring for and accounting of these various supplies requires a good clerk. Experience shows that when either an inside or outside foreman is charged with this duty, the results are unsatisfactory and the company suffers a loss. A foreman who is pressed with too much clerical work ceases to be a competent foreman and, in many instances, makes a poor clerk besides.

THE "FOLLOW-UP" PLAN A MOST IMPORTANT FEATURE OF ANY ACCOUNTING SYSTEM

The groundwork of any accounting and supply-distribution system is the "follow-up" plan. The person in authority must see that all material is used for the purpose and in the place for which it was ordered. This is specified on the requisition, which must be certified by the mine foreman as needed for the purpose named, and duly authorized by the superintendent or manager, before it can be honored by the storekeeper and the material delivered.

The form of such requisition, as given here, shows the monthly requirement when possible, the quantity on hand, previous orders unfilled, quantity required, kind of material, its use or purpose, approximate value and order number. The requisition bears the date when it is presented and is made out in duplicate, the original being sent to the general manager, as soon as it is filled, and filed in his office, while the copy is retained by the storekeeper, for reference. The same form of requisition is used when the material wanted is to be furnished by the purchasing agent, the office, warehouse or any of the shops or other departments of the company.

Another blank form is used by the storekeeper or other person when delivering goods or material. As

SUNSET COAL COMPANY

Page No.....

Stock Account, Fiscal Year 191.....—191..... Warehouse

Item Unit of Measure																	
Month	On Hand	Received	Total	Distributed	On Hand	Received	Total	Distributed	On Hand	Received	Total	Distributed	On Hand	Received	Total	Distributed
Nov.																
Dec.																
Jan.																
Feb.																
Mar.																

here shown, this form specifies the department furnishing the material, where it is to be delivered and the date, quantity, requisition number and value. It is made out in triplicate, the storekeeper who delivers the goods to the teamster, and the party who finally receives them keeping their respective forms for reference, while the teamster, after delivery, sends his receipt to the office.

Speaking of "following up" a requisition, it is not only important to see that supplies and material furnished are actually used as intended and not appropriated or carried off by individuals, but the department filling the order should see that material having a higher

DUPLICATE

No..... **SUNSET COAL COMPANY** Date.....191....

Please furnish for..... (Place) Material required for use during..... (Month or Period)

Monthly Consumption	Quantity on Hand this Date	Unfilled Orders this Date	Quantity Required	Description of Material	Purpose for Which Required	Approximate Value	Order No.

I hereby certify that I have carefully examined this requisition and that the articles required are for the uses named.

..... Foreman

Correct, to be furnished by
Purchasing agent — Machine shop
Warehouse — Carpenter shop
Office — Electrical shop
Stable — General mine
No..... Warehouse
..... Supt.

Authorized

..... General Manager

market value is not used when cheaper material will give the service required. For instance a foreman may, without thought or knowledge, specify bronze or brass when iron would answer the purpose.

The Pennsylvania Railroad employs inspectors whose business it is to check up all material stocks on hand in its offices, towers, warehouses and section houses and report monthly. While I have no desire to advocate an increase of official duties, it is my belief that the right sort of supply "follow up" will require a similar check-

SUNSET COAL COMPANY

Supplies sent from.....
To.....
Date.....191...

Quantity	Material	Req. No.	Amount

Teamster.....
Received the above.....
Signed.....
Teamster will return this receipt to office

SUNSET COAL COMPANY

Supplies sent from.....
To.....
Date.....191...

Quantity	Material	Req. No.	Amount

Teamster.....
Received the above.....
Signed.....
Party receiving supplies will keep this receipt

SUNSET COAL COMPANY

Supplies sent from.....
To.....
Date.....191...

Quantity	Material	Reg. No.	Amount

Teamster.....
Storekeeper will keep this receipt

to abide strictly by the rules, and a statement should be rendered each foreman, showing his material cost and credits for the month. The danger in supply accounting lies mainly in the fact that a foreman desiring to make a good showing will frequently sacrifice the upkeep of equipment in his charge.

Two instances of this came to my notice a short time ago. In the first, the attempt to cut down the operating expenses at one colliery resulted in such a sacrifice of boiler-room equipment that a chemical test of the ash

ing system applied oftener than the customary yearly inventory.

In order to obtain the best results and secure the highest economy in the use of material, the storehouse and, in fact, each department of the company should be considered as a separate and independent business having its own head and organization, and selling its products to the operating department at a sufficient profit to cover its own overhead charges. On the other hand, it should receive and credit the operating department with all unused material and scrap. If supplies of any kind are sold to individuals a fair profit should be realized on such business, and a statement sent to the office, showing kind, quantity, cost and selling price of the articles sold.

While all supplies and material should be issued, as previously stated, on an authorized order or requisition, the rules should be flexible enough to allow of material being secured for any emergency, on the assurance that the order for the same will follow. This is necessary in order to avoid an expensive delay in the operation of the mine when a breakdown has occurred and repairs must be made at once.

Many mine foremen are averse to writing orders for material needed in the mine, but they should be obliged

dump, made a little later, showed an unwarrantable loss in the generation of power, and the needed repairs were then quickly made.

In the second case, the habit of the officials to cut requisitions led, on the death of the colliery machinist, to the discovery of a regular storehouse of brass and other supplies hidden beneath the shop floor. I cite these instances, which are not uncommon, to show the importance of pursuing a wise course in the supply of material required. There should neither be "feast" or "famine," but a workable stock sufficient for every call should be available at all times, at every mine.

——— Penn. J. KENVIN.

INQUIRIES OF GENERAL INTEREST

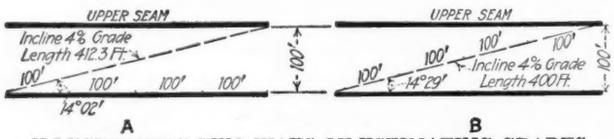
Estimating Percentage of Grade

Recently we have been having an animated but very friendly dispute as to the proper method of estimating the percentage of the grade of an incline. The question under discussion is, What would be the length of a plane between two level seams of coal separated by 100 ft. of rock strata? The plane is to be driven on a 25 per cent. grade.

Using the method that I have been taught to apply in such cases, I find the length of the plane, in this case, to be 412.3 ft. One of the best mine foremen in this valley, however, disputes this result, claiming that the length of the plane should be exactly 400 ft.

Comparing his method of calculation with my own, I find that the difference lies in the fact that he estimates the percentage of grade as being the rise in 100 ft. of pitch distance, while my understanding is that the percentage of grade is based on horizontal measurement. For example, in the present case, the 25 per cent. grade would represent a rise of 25 ft. in 100 ft. of horizontal distance. The question is, Which of these methods is correct?

In order to present the case clearly, I have shown in the accompanying figure my own method at *A* and



ILLUSTRATING TWO WAYS OF ESTIMATING GRADES

that of my friend at *B*. In each of these, the two seams of coal are shown as separated by 100 ft. of strata, and the incline, in each, is indicated by the dotted line. The sketch *A* shows the measurements to be taken in 100-ft. lengths on the horizontal line, while in *B* they are shown as taken on the incline.

In order to find the length of the incline, in the first instance (*A*), it is necessary to find the pitch angle or the angle between the incline and the horizontal. The tangent of this angle is equal to $25 \div 100 = 0.25$ and the corresponding angle is 14° 02′. The length of the incline is then found by dividing the distance between the two seams (100 ft.) by the sine of this angle; thus, $100 \div 0.24249 = 412.3$ ft.

Referring now to the second method, shown at *B*, it is clear that if the incline rises 25 ft. in each 100 ft. of pitch distance, there will be as many hundred-foot measurements as the rise per hundred feet is contained in the distance between the seams, or $100 \div 25$ equals four 100-ft. measurements. The length of the incline, in that case, would be 400 ft. Kindly say which of these two methods should be used. MINING ENGINEER.

Scranton, Penn.

Replying to this correspondent, it can be stated that both of these methods are equally correct and both are in use. The usual practice in slightly pitching seams, however, is to estimate the percentage of grade as the *rise per hundred feet of horizontal distance.* Many engineers, also, prefer to use this method in fairly steep seams, the advantage being that the measurements are all taken in the horizontal plane and can be platted on the map without change.

On the other hand, a very common practice in steeply pitching seams is to make all measurements on the pitch, and in such cases many engineers prefer to estimate percentage of grade as the *rise per hundred feet of pitch distance.*

Of course, it is always necessary, in stating the percentage of grade, to understand clearly whether such percentage is based on horizontal or on pitch distance, since the results obtained are different in each case. That is to say, a 25 per cent. grade, based on horizontal measurement, does not represent the same incline as a 25 per cent. grade based on pitch measurement.

As previously stated, some engineers would prefer one method and others another, both being equally correct. Many misunderstandings and disputes have arisen similar to this one, because the parties do not recognize that the percentage of grade given may have been computed on the horizontal or plat measurement, which we believe the more common practice in coal mining, except where the seam has a high pitch.

We shall be very glad to have engineers and mine surveyors give their own preferences. The discussion will no doubt show the importance of understanding whether a given grade is based on horizontal or on pitch measurement, as otherwise grave errors will frequently result in the interpretation or reading of mine maps. The discussion should show the relative advantages of the two methods.

Calculating a Room Switch

We are opening a new mine and have decided to adopt a track gage of 42 in. The roof and floor conditions are such as not to permit driving entries or turning rooms a greater width than 12 ft. We shall use a car having a length over all of 8 ft. 9 in.

Kindly permit me to ask some of the practical readers of *Coal Age* to inform me what should be the dimensions of a room switch that will give the most satisfaction, under the conditions I have mentioned, and what frog number would give the best results.

————, Tenn. MINE FOREMAN.

This is a good practical question on the solution of which very much of the successful operation of a mine will depend. The theory of calculating the correct dimensions of mine switches has been explained so often in *Coal Age* that we are glad to submit this inquiry to our practical readers for their solution, which we hope to receive,

EXAMINATION QUESTIONS

West Virginia Examination (1918) Mine Foreman and Firebosses

(Selected Questions)

Ques.—How would you determine the quantity of air passing, where the section of the airway is 9 ft. 6 in. wide and 5 ft. 3 in. high?

Ans.—Measure the velocity of the air at that point of the airway, being careful to obtain a fairly approximate average reading for the entire section. Then calculate the sectional area of the airway, thus: 9.5 × 5.25 = 49.875, say 50 sq.ft. Assuming an average velocity, at this point, of say 600 ft. per min., the quantity of air passing is 600 × 50 = 30,000 cu.ft. per minute.

Ques.—In a gaseous mine where 175 persons are employed, would you consider the ventilation sufficient, providing the quantity of air in circulation is equal to 150 cu.ft. per min., per man?

Ans.—The West Virginia mining law (Sec. 26) requires the circulation of 150 cu.ft. of air per min., per man, in mines where there is danger from gas being liberated, and as much more as the district mine inspectors may deem necessary. The circulation must, therefore, conform to these requirements of the law. Conditions may arise, however, between the visits of the district inspector, that would call for the judgment of the mine foreman in regard to the sufficiency of the air in circulation. The foreman must decide these conditions according to his best judgment and experience, basing his decision on the percentage of gas in the air and the quantity of dust carried in suspension in the current, having due regard to the inflammability of the coal and the fineness of the dust.

Ques.—Under what circumstances may a body or an accumulation of gas fail to be removed after the ventilation has been restored?

Ans.—The circulation of air may not reach the body of gas accumulated at the face or in cavities of the roof, and it will then be necessary to erect brattices to cause the air to sweep those places. Again, the velocity of the air may be insufficient to remove the gas, which is frequently the case when methane or marsh gas has accumulated at the face of a pitch or blackdamp at the face of dip workings. In either case, a strong current of air is required to drive out the gas or force it from its lodging place.

Ques.—(a) Would you consider it safe to work with open lights in any portion of a mine liberating explosive gas? (b) What precautions would you take to insure the safety of the workmen? (c) What material should be kept on hand at mines liberating explosive gas? Answer fully.

Ans.—(a) Assuming the conditions in the mine are such as to require the use of safety lamps in one or more sections of the workings, it would not be safe to use open lights in any portion of the mine whatever. In other words, mixed lights should never be used in a mine.

(b) In a mine generating gas in dangerous quantities, safety lamps of an approved type should be used exclusively. These lamps should be the property of the company and inspected, cleaned and filled by competent lamp men, after each shift. All lamps should be numbered to correspond to the check numbers of the men and should be delivered to them in return for their checks, as they enter the mine. No man should be permitted to use or handle a safety lamp in the mine, until he has given evidence that he understands the principle of the safety lamp and its proper use. The fireboss should observe closely the lamps of the men when making his daily rounds, and give them any needed instructions in regard to their proper use.

(c) At all mines liberating explosive gas, first-aid outfits should be kept at convenient points in the mine and on the surface. The outfits should include pulmotors, oxygen tanks and breathing apparatus of approved type. There should also be provided stretchers, blankets and waterproof coverings ready for immediate use.

Ques.—Under what conditions would you recommend and use mixed lights in a mine?

Ans.—Under no conditions should mixed lights be used in any mine.

Ques.—State in detail your opinion of the causes of the explosions that have occurred in this and other states and state what, in your opinion, can be done to prevent these disasters?

Ans.—The chief causes of mine explosions are the following: Reckless use of powder and other bad practices in blasting; disobedience of mine workers to the instructions given them and to the rules and regulations of the mine; lack of supervision on the part of mine officials; disregard of the provisions of the state mining law; the improper handling of or meddling with safety lamps.

To prevent these occurrences, a closer supervision of the mine is required and a strict compliance with the mining laws, together with greater mine discipline and a higher regard for safety on the part of mine officials.

Ques.—When does a fireboss' duty in the mine cease and what are the duties of each miner upon entering his working place?

Ans.—The duties of a fireboss in the employ of a coal company do not cease, as long as he is within reach or call. Should any condition develop requiring his presence, it is the duty of a fireboss to respond promptly to a call for assistance. A miner's first duty on entering his place after absence is to observe its condition, examine the roof and reset any timbers that he finds have been displaced.

COAL AND COKE NEWS

What Happened in September

[The bracketed figures in the text refer to pages in the present volume and should the reader desire further information he can obtain it by reference to the pages indicated.]

Sept. 2—Flood invades Mary Lee mine of Alabama Co. at Lewisburg, Ala., and drowns two men [525].

Sept. 3—William G. McAdoo makes report to President saying, "It is probable that adequate transportation for the fuel requirements of the Nation will be available provided the coal production during the warm weather can be maintained at a point that will fully employ the cars requisitioned. (This report was held for some time before publication.)—Preference list No. 2 of the Priorities Division of the War Industries Board is issued, but is not made public till Sept. 8 [514]—United States Fuel Administration revises prices of coal at mines in Wise County, Texas, and provides for summer reductions from these standard prices—Rocky Mountain Mining Institute holds annual meeting in conjunction with American Institute of Mining Engineers; to last till Sept. 6 [633-641].—United States Fuel Administration reduces price of byproduct coke 30c. a ton throughout the United States except in the states of Alabama and Washington [513].

Sept. 4—United States Fuel Administration grants companies the right to charge reasonable switching charges where these have been paid to the shipping railroad for the diversion of coal wherever such diversion has been ordered by the Fuel Administration to relieve a shortage of fuel—Believing that the labor employed in the reclaiming of the good material in breeze dumps at beehive coke plants could be better employed in the work of manufacturing coke, such reclamation of breeze is prohibited by the United States Fuel Administration—United States Fuel Administration forbids any producer in the high-volatile coal-producing districts of the Thacker and Kenova regions of West Virginia and Kentucky and along the Kanawha & Michigan, the Kanawha & West Virginia and the Coal & Coke (West of Dundon) railways and their short-line connections; also in the eastern Kentucky fields along the Chesapeake & Ohio and Sandy Valley and Elkhorn railroads and their short-line connections; also in the Logan and Kanawha districts west of St. Albans, W. Va., along the Chesapeake & Ohio Ry. and short-line connections; also in Virginia along the Louisville & Nashville R.R. in Kentucky along the same road and the Cincinnati, New Orleans & Pacific Ry. and their short-line connections; in Tennessee along the line of the Cumberland Valley Division of the Louisville & Nashville R.R. and along the Middlesborough R.R. to sell, ship or distribute their coal to dealers and consumers for use or consumption in the lower peninsula of Michigan except after a permit has been given [513, 648]—United States Fuel Administration forbids any producer in the coal-producing districts of Ohio and in the coal-producing districts located on the Ohio River division of the Baltimore & Ohio R.R. in Mason County, West Virginia, to sell, ship or distribute coal to points in the lower peninsular of Michigan located on or east of the line of the Grand Rapids & Indiana R.R. and its branches except when granted a permit [513, 648]—United States Fuel Administration grants permission to any Illinois producer to ship to that portion of the State of Wisconsin on and north of a line coincident with the Green Bay & Western R.R. from Kewaunee, Wis., to Amherst Junction and thence coincident with the Minneapolis, St. Paul & Sault Ste Marie R.R. through Abbotsford and Chippewa Falls to Minneapolis, Minn. [513, 648].

Sept. 5—Annual meeting of New York State Retail Coal Dealer's Association.

Sept. 6—Conferring with his railroad chiefs of the Eastern region, William G. McAdoo declared: "There is no chance of another great railroad tie-up such as was experienced last winter, and there is no danger of a fuel débâcle so far as the railroads' part in preventing one is concerned. The roads will be able to handle all the coal that the miners can extract [556]—Judge Edwin B. Parker, the priorities commissioner of the War Industries Board, formulates lists of the priority of works needing new permits or licenses [514].

Sept. 7—Arrangement made by United States Fuel Administration by which the Consolidated Coke Co. of Pittsburgh pays $80,000 to the Steel Company of Canada, of Hamilton, Ont., and to the Thomas Iron Co., of Hokendauqua, Penn., for poor coke delivered to them [557].

Sept. 8—Bernard M. Baruch, chairman of the War Industries Board, lists in Class I for preferential treatment under the new selective-service legislation, plants producing coal, those engaged principally in manufacturing mining tools or equipment, those engaged principally in producing metallurgic coke and byproducts including toluol—Motor runners in four mines of the Delaware & Hudson Co. go on strike [558].

Sept. 9—National Coal Association points out the falsity of William G. McAdoo's statements relative to the ability of the railroads to handle all the coal offered to them [556]—The West Virginia and Kentucky Coal Co., on Smoot Creek, Letcher County, Kentucky, ships its first consignment of coal [714].

Sept. 10—By the fall of a cage in the Protection Island shaft at Nanaimo, B. C., 16 miners lost their lives [617].

Sept. 11—W. J. Murray, chairman of the executive committee of the Victor-American Fuel Co. and a well-known coal expert, dies at La Jolla, Cal. [643].

Sept. 12—Tipple of the Ella Mine of the United Coal Corporation falls on tracks of the Pittsburgh & Lake Erie R.R., carrying down three men who, nevertheless, escape uninjured [618]—Logan Coal Co., of Philadelphia, Penn., is fined $25,000 and money is given to Pennsylvania chapter of the American Red Cross. It is charged with selling coal as smithing coal that was to be used for other purposes, so as to get the higher price. It is required to make equitable return of money to all parties that had been overcharged.

Sept. 14—The United States Fuel Administration announces a revision of the regulations governing the storage of coal by consumers of different classes [602].

Sept. 15—Big production meeting of West Virginia operators held at White Sulphur Springs, W. Va. [605].

Sept. 16—Big strike occurs in the southern anthracite field, the miners demanding the United States Fuel Administration to decide, at once, on the increase of wages to be provided [607]—Annual congress of National Safety Council at St. Louis meets; to last till Sept. 20 [502-503].

Sept. 17—Four collieries of the Delaware & Hudson Co., Grassy Island shaft, Grassy Island slope, the Olyphant and Eddy Creek collieries, return to work [650].

Sept. 18—Senator Myers, of Montana, introduces a bill prohibiting the sale of intoxicating liquor within 5 miles of coal mines for 60 days after Oct. 1.

Sept. 19—Southern anthracite strike practically comes an an end [607]—Meeting of operators, officials of insurance companies, mine inspectors and officials of the Harrisburg headquarters of the Department of Mines convenes in Harrisburg for readjustment of insurance rates particularly for anthracite mines [662].

Sept. 21—The mine workers of District No. 1 of the anthracite region, representing 70 local unions, protest against the declaration that they are not patriotic and promise to coöperate with United States Fuel Administration [650]—Plant of Hazard Coal Co., Hazard, Ky., is destroyed by fire [663]—Gladstone and Michel locals vote not to return to work till single shift is reëstablished—Union leaders in District 18 suggest that an arrangement be made establishing the single shift for 30 days during which time the single shift might be discussed.

Sept. 23—Explosion at the mine of the Franklin Coal and Coke Co., Royalton, Ill., kills 23 men [714].

Sept. 24—Elbert H. Gary, chairman of the board of directors of the United States Steel Corporation, declares in favor of the 8-hour day [650].

Sept. 25—Mine workers at Fernie declare that they will call out firemen, pumpmen and fanmen if their demand for a single shift is not conceded without reservation and a promise made to give all men work within 30 days—C. A. Magrath, fuel controller of Canada, met Pictou County, Nova Scotia, mine workers and operators and suggested a 20c. per hour increase in wage to the former, retroactive and good till Jan. 1.

Sept. 27—Dr. H. A. Garfield denies that he or the Federal Fuel Administrator for New York has issued an order that coal be not used for heating before Nov. 1—Committee on mechanical labor-saving devices in mining appointed—Pictou County, Nova Scotia, strike comes to an end—W. H. Armstrong orders that the Crow's Nest Pass Coal Co. work single shift and proposes that a Royal Commission review the dangers in the mines of the company and report with recommendations.

Sept. 28—The Fourth Liberty Loan campaign for $6,000,000,000 starts.

Sept. 30—Gladstone local in Fernie, B. C., turns down proposition conceding the single shift but providing for the appointment of Royal Commission to ascertain just what attitude should be taken toward the practice of running a mine more than one shift in 24 hours.

Harrisburg, Penn.

Officials of the State Department of Mines are making an effort to learn the number of abandoned mines or workings in both the anthracite and bituminous fields which have been reopened or which it is planned to put back into operation this winter. The number is believed to be greatest in the soft coal field, and there have been reports received here of mines which have been idle for so long a time that weeds and brush grown up about the openings have to be cut away to enable examinations to be made. Some of these are to be started again. In the anthracite field there have been some surveys made to determine how soon certain veins can be reached. If all the plans that have been heard at the Capitol materialize, there will be a large increase in the production of coal next year.

The rapid progress of the Spanish influenza epidemic in the coal regions has had a noticeable effect on coal output, and it is feared that unless the epidemic is checked shortly the output for October will be cut to a greater extent than realized. The military authorities of the State are coöperating with the State Health Department to prevent a further spread of the disease and to more adequately handle the cases now reported.

Fifty-eight deaths in one day was the record for the little mining town of Minersville, in the Schuylkill region, and other mining towns are reporting many deaths. The epidemic has caused a number of collieries to close down entirely. The State Department of Health has ordered all saloons, moving picture houses, churches, etc., to close until the epidemic is over.

Uniontown, Penn.

A drop of 27,000 tons of coal over the output of the preceding record-breaking week is shown in the official fuel production figures for the week ending Oct. 5. The showing was admittedly disappointing, despite the fact that curtailment of power service hampered the output and that an alleged flourishing business in the sale of liquor through the region affected the individual efficiency of the men. The coal shipments for the week were 227,263 tons and the coke shipments 427,449 tons.

Effect of the Spanish influenza epidemic which has hit several plants in the region is causing some concern, the most serious trouble so far being reported at the Continental No. 2 plant of the Frick company,

where drastic steps quickly got the disease under control but only after quite a few cases had been reported.

Especially interesting in this connection just now will be the effect of prohibition in the coke region as a result of the order closing the saloons throughout the state to prevent the spread of the influenza epidemic. Operators and producers for months have been vigorously demanding prohibition, and the results of the closing of the saloons in the county are being followed with more than usual interest. While the sale of liquor has not been entirely eliminated in the region as a result of the order, officials feel that the saloon closing order will have a noticeable effect in the production.

Charleston, W. Va.

Power shortage, late placements and a dwindling car supply as the week progressed figured largely in limiting production in the Fairmont district last week. On the first day of the month the supply—1420 cars—was considered rather a good one. Of this number 1118 cars had been placed at 7:00 o'clock in the morning, but on the same day many mines were operated with difficulty owing to their inability to secure enough power. On the 2d the supply dwindled to 1230 cars. On the same day an order came directing all box cars on all sidings to be shipped west for the shipment of grain, the significance of the order being that it meant that team and truck loaders, for the time being at least, would be no longer supplied even with box cars for the loading of coal. It is estimated that 22 mines in the region will be affected, and that production will be curtailed to the extent of 200 cars of coal a day. Car shortage was at its worst, however, on the last day of the week, when there were but 612 cars supplied, only 387 of them being placed at the usual hour for beginning the day's work. Wrecks and the influenza were said to have upset transportation conditions on the Baltimore & Ohio R. R. Production in the Pocahontas and Tug River District is the second best since last March. Production for the week mentioned reached a total of 469,732. A special drive is being made in the Tug River and Pocahontas districts to reach 2,000,000 tons during October, and gains are being made day by day. The coal will probably be reached unless Spanish influenza affects the man power of the district.

The shipment of coal from the Guyan field is steadily on the increase, the car supply in the district having made that possible. The movement of coal to the lakes from this district will be continued throughout October. Tidewater tonnage is very heavy now and is increasing constantly.

Production in the Kanawha District is now at the rate of 40,000 tons a week more than it was at the close of August. Production during the last week of September had almost reached the high-water mark for the year, but a loss was sustained last week, the total output being only 204,438 tons as compared with 217,000 tons for the week previous, a decrease of 13,000 tons, produced in 6065 working hours. Losses from labor shortage amounted in hours to 794 and production loss from car shortage to 466. Car service for all the mines in the Kanawha region was all that could be desired, but cars were late in being placed.

Production has shown a decrease during the last week in both the New River and Winding Gulf districts, but this week there is said to have been an improvement. Operators contend there are certain neutralizing influences at work in the district. However, coal men are confident that production for October will average well above that for September.

Birmingham, Ala.

Disappointment is noted over the figures for the week ending Sept. 28, when only 383,067 tons of coal were produced in Alabama, against 383,142 tons for the week ending Sept. 21. Coal production in the state during the entire month of September amounted to only 1,544,769 tons.

Explanations continue to point to faulty railroad car service, unsteady labor and natural causes. However, coal mining in the district has been active during the last week, and the hope is again advanced that the official figures for the week ending Oct. 5 will show an increase of at least 17,500 tons over the production of the previous week. There is being made an appeal for renewed efforts on the part of all mine workers and operators to swell the coal production totals, in an effort to make up a portion of the shortage of output. A weekly production of 425,000 tons or more is the goal now being sought.

Within three months coal will be produced at the new mines of the Republic Iron and Steel Co. at Risco, in the extreme western portion of Jefferson County. A large coal washer is being installed at the mines, and the Republic company is spending $500,000 on improvements. Daily production of the new mines, when full operation is begun, is expected to total in the neighborhood of 1200 to 1500 tons.

It is also announced that by January, 1919, fuel production at the mines of the Railway Fuel Production Co. at Parrish will total over 1000 tons of coal daily. Increased production of coal at Getmore, in the lower part of Jefferson County, is also looked for in a short period of time.

Employees are being assured that they will be cared for when their names are reached in the selective service call list. The Alabama Coal Operators' Association has received information from the Production Committee of the National Fuel Administration that pick miners are regarded as being engaged in an essential industry. This information is being given wide publicity throughout the district.

After many promises of service, transportation of coal on the Warrior River will begin Nov. 1, according to a statement made in Mobile by Henry DeBardeleben, Federal Manager of Warrior River traffic. Regular barge service will be inaugurated between Mobile and New Orleans, and Mobile and Cordova, on the Warrior, on that date. Six self-propelled barges will comprise the initial fleet. Other barges will be put on after November 1, as the traffic increases.

Coke production in the Birmingham District continues to be found somewhat short, both in quantity and quality. Attention is being given this commodity, however, with hope of marked improvement by gradual degrees.

Victoria, B. C.

British Columbia's production of coal for the month of August totaled 240,055 tons, which is an increase of 13,467 over July, and the highest tonnage produced in any month so far this year. Vancouver Island takes the lead in comparison with the output of other Provincial collieries, having 145,266 tons to its credit. The Crow's Nest Pass mines are next with 78,971 tons, while the Nicola Princeton District shipped 15,818 tons.

Of the Island companies the Canadian Collieries, Ltd., have the best showing with 71,791 tons, the Canadian Western Fuel Co. following close with 61,200 tons. The balance is accounted for by the smaller collieries as follows: Pacific Coast Coal Mines, South Wellington, 6858 tons; Nanoose Collieries, 2631 tons; Granby Consolidated Mining and Smelting Co. (Cassidy's), 2383 tons; British Columbia Coal Co. (Jingle Pot), 400 tons.

In the Crow's Nest Pass District the Crow's Nest Pass Coal Co. produced 66,457 tons from the two collieries operated, as follows: Coal Creek Colliery, 44,366 tons; Michel Colliery, 22,091 tons; Corbin Coal and Coke Co., 12,514 tons.

The Middlesboro Collieries were the biggest producers in the Nicola Princeton District with a tonnage of 8529, the remainder coming from the smaller collieries.

The new mines being opened on the Island are beginning to count in the monthly production, these recently opened up at South Wellington and Cassidy's having an output of 5530 tons for the month, while it also is to be noted that the Jingle Pot, for months sealed by order of the Chief Inspector of Mines because of fire, is again on the shipping list. But the most remarkable gain is that of the Harewood mine of the Canadian Western Fuel Co., which was recently reopened and last month produced 21,695 tons.

At the other new mine, which is being opened by the Canadian Western Fuel Co. on the farm near Nanaimo, rapid advances are being made. Two shafts are being sunk to tap the Wellington Seam, and one of these struck the coal a few days ago, exposing a seam about 9 ft. in thickness. The other is expected to reach the same seam some time during the present month.

The total production of the coal mines of British Columbia so far this year is 1,822,031 tons. For the same period last year it was 1,535,998 tons. Therefore there has been a gain of 286,033 tons.

PENNSYLVANIA

Anthracite

Mahanoy Plane—The Stanton, Lawrence and Bear Ridge collieries at this place, twice abandoned as worked out, are now producing hundreds of tons of coal daily under Madeira Hill & Co.'s direction.

Mauch Chunk—Hacklebernie, the first anthracite mine in the world opened after the discovery of the hard-coal at Summit Hill in 1794, and closed years ago by the Lehigh Coal and Navigation Co., will shortly be opened by the Mount Pisgah Coal Co., of this place.

Hazleton—The Morea colliery of the New Boston Coal Co., southwest of Hazleton, has been electrified throughout and the use of steam and mules discontinued. Many thousands of dollars were spent in making the change, and no time was lost in producing coal, all the work being done Sundays and at night.

The Hollywood colliery of Pardee Brothers & Co. at Hazleton, abandoned 30 years ago, has been reopened. The operation furnishes employment to about 200 mine workers.

Wilkes-Barre—Damage in excess of $50,000 was caused in the town of Plains on Oct. 9 when a cave-in of coal veins in the Conlon mines let down the earth between a block of houses fronting on Main and Maffett Sts. One wall of the new Plains high school was shattered. Miners had been warned, and there was no loss of life.

Larksville—The Delaware & Hudson Coal Co. has taken steps to aid the men in keeping down their monthly expenses by reason of the increased carfare from Plymouth to the collieries in this district. The officials have placed a small mine locomotive with a string of cars at the disposal of the men. An effort is being made to have several passenger coaches placed.

Ashley—Scarcity of timber for use in and about the mines is giving the coal companies much concern at this time. Though the operators here have a considerable stock on hand, yet they fear they will have difficulty replenishing their stock when cold weather sets in. It is for this reason many of the collieries are buying heavily of timber and using all possible means to secure an ample supply. The Lehigh & Wilkes-Barre Coal Co. has installed a complete milling outfit and is rapidly taking all the available timber from its property, especially on the mountains in the Wilkes-Barre district.

Mahanoy City—One of the largest sales of coal lands that has occurred in the southern anthracite fields for some time was consummated by the delivery recently by the heirs of the late John Farnum to the Lehigh Coal and Navigation Co., of a deed for the Farnum interest in a tract of land long known as the Farnum and McGinnis tract containing 202 acres situate in the boroughs of Mechanicsville and Point Carbon, the townships of Norwegian and East Norwegian and the City of Pottsville and embracing much of Lawton's Hill within its lines. The tract contains rich coal deposits which will in a short time be worked by the Lehigh Coal & Navigation Co. The price paid for the land was $1200 per acre for a fee simple title. Where only the coal reserve was purchased the price was $700 per acre.

WEST VIRGINIA

Logan—The Gay Coal and Coke Co., by opening entry No. 21 to Coal Branch, will be able to give the loaders more cars. A steam locomotive has been purchased by this company in order to insure the loaders a better supply of cars.

Charleston—Having purchased nearly 2000 acres of coal land on Campbell's Creek, Kanawha County, D. Lewis, who has extensive operations in the county, will proceed in the near future to develop the tract acquired by him. It is said that Mr. Lewis paid an average price of $10 an acre for the coal property, which was acquired from Josephine D. Taylor, of New York.

Huntington—The Amherst Coal Co., operating in Logan County, has installed facilities for storing from 8000 to 10,000 tons of coal at a time when cars sufficient to load the coal are not available. The company uses a steam hoist for loading coal into the cars and the company has found it possible to load a railroad car in 22 minutes.

Fairmont—In connection with the recent organization of the Dawson-Connellsville Coal Co., it is the purpose of the new company to double the capacity of the plant acquired by the company together with a 100-acre tract of Sewickley or Mapletown coal located just below Monongah, on the east side of the West Fork River. The company acquired a mine producing 500 tons daily and proposes to increase the capacity of 1000 tons per day. The mine is a drift opening and is drained naturally.

OHIO

Piney Fork—The Piney Fork Coal Co., with headquarters in Columbus, had its gigantic steam shovel at the stripping operation near here buried by a slide, and the operation was idle for about two weeks. It will soon be in operation.

Zanesville—Six miners living near Zanesville and employed in surrounding mines have been placed under arrest by United States authorities on the charge of stirring up disaffection among the miners of that section. The arrest was made by U. S. Deputy marshals and government secret service operatives. The men will be held on the charge of sedition.

KENTUCKY

Jackson—Baker Brothers have purchased coal land on Frozen Creek and plan early developments.

Willard—The Black Raven Coal Co. will install electrical machinery, increasing daily output to 1000 tons.

Madisonville—C. B. Curtis, president of the new Curtis Coal Co., is having some trouble in getting a switch into the company's new property at Madisonville, and has taken the matter up with the officials of the Louisville & Nashville R.R. Co. in order to get action.

Hazard—The Daniel Boone Coal Co. is nearing completion of its new mining camp at Heiner, in the Hazard field, and the third mine of the group will be started about Dec. 1. The company will have a modern camp, with much better features than commonly found in the district. The operations are on a part of the Maynard Coal Co.'s interests.

INDIANA

Vincennes—The Pike Coal Co. mine, near Petersburg, Ind., was destroyed by fire, said to have been of incendiary origin, early on Oct. 7. The loss is estimated at $125,000. The mine had recently been remodeled, the tipple enlarged and the capacity increased to 3000 tons per day. Officers of the company said an effort would be made to rebuild at once.

ILLINOIS

Royalton—Mine rescue teams from Duquoin, Dewaine, Benton and Herrin recovered 14 bodies on Oct 13 from the north mine of the Franklin Coal and Coke Co. The men, with seven others whose bodies were recovered earlier, were killed by an explosion a week before. It will probably be two months before the mine can be operated again.

Danville—The Hartshorn mining interests in Danville, Ill., and Ohio districts have been sold for approximately $2,000,000, the purchasers being Chicago, New York and London capitalists, headed by George C. Moore. The properties consist of the Beech Flat Coal Co., of Ohio, and the Mission Mining Co., Two Rivers Coal Co., Carbon Hill Coal Co. and Hartshorn Coal Co., all of the Danville district. Mr. Moore is well known in Chicago financial districts as one of the receivers for the Chicago & Milwaukee Electric Railway Co., recently reorganized.

Foreign News

Lens, France—British troops on entering Lens found that the coal mines in the city had been entirely destroyed.

Vancouver, B. C.—During the past few weeks it has been reported that the dealers intended again raising the retail price of coal. This resulted in considerable public agitation which has culminated in the announcement from the former that it is not proposed to advance charges. Instead, they explain, and to offset the increased overhead expenses of handling coal, they have decided to stop the screening of coal in Vancouver. The coal hitherto has received screenings both at the mines and at the dealers' bunkers, the latter operation costing, it is figured, about 20c. a ton. Incidentally the merchants assert that the criticism which has been levelled at them is unfair inasmuch as the mine operators have taken much the greater proportion of recent increases in coal prices. They further state that the same coal as that sold on the lower British Columbia mainland brings from $1.50 to $2 a ton more in Seattle, Wash., while the only extra charge the dealers of the latter city have to contend with is an additional towage fee of 15c. a ton.

Personals

C. C. Anderson, of Boise City, Idaho, has been named as state fuel administrator to succeed Frank E. Gooding, who resigned to become a candidate for state senator.

A. L. Rattray, formerly city clerk at Nanaimo, B. C., has accepted the position of accountant with the Granby Consolidated Mining, Smelting and Power Co., at its new colliery at Cassidy's near Nanaimo, B. C.

Lloyd Dock, division engineer for the Rochester and Pittsburgh Coal and Iron Co. at Punxsutawney, Penn., has been made chief engineer of the Coal Run Mining Co. and Tide Coal Mining Co. at Indiana, Penn.

J. T. Morris, superintendent of the Stotesbury, W. Va., operation of the E. E. White Coal Co., has resigned to accept the position of general manager of the Pemberton Coal and Coke Co., with headquarters at Affinity, W. Va.

Sheldon Smiley, chief engineer for the Rochester and Pittsburgh Coal and Iron Co. at Indiana, Penn., has resigned that position to take charge of the Pittsburgh, Penn., office of the Wood Engineering and Manufacturing Co., of Chicago, Ill.

James Renney, overman for the past two years at the Reserve mine, operated by the Canadian Western Fuel Co. at Nanaimo, B. C., has resigned his position and gone into business, having taken over the interests of the MacFarlane Wharf Co., Nanaimo, B. C.

James A. Bier has resigned as chief engineer of the Coal Run Mining Co. and the Tide Coal Mining Co., of Indiana, Penn., to become superintendent of the Horatio mines of the Anita Coal Mining Co. at Punxsutawney, Penn.

Francis John has been appointed overman at the Reserve mine of the Canadian Western Fuel Co., Nanaimo, B. C., to succeed James Renney, resigned, as mentioned elsewhere in these columns. Mr. John was tipple boss at the Harewood mines of the Canadian Western Fuel Co.

Obituary

Steve Harding, division engineer for the Jefferson and Clearfield Coal and Iron Co. at Punxsutawney, Penn., died Saturday, Oct. 5, from pneumonia, superinduced by Spanish influenza. Mr. Harding was engineer for several mines in the infected district and probably caught the disease while at work. He was taken to his home in Clarion, Penn., for burial.

Recent Coal and Coke Patents

Mine Car. M. S. Runsvold, Bisbee, Ariz., 1,276,468. Aug. 20, 1918. Filed Sept. 7, 1917. Serial No. 190,211.

Mining Machine. E. C. Morgan, Morgan Park, Ill., 1,276,249. Aug. 20, 1918. Filed Aug. 15, 1910. Serial No. 577,134.

System of Mining Coal. E. O. Toole, Gary, W. Va., 1,276,952. Aug. 27, 1918. Filed Mar. 16, 1914. Serial No. 824,979.

Mining Drill. J. A. Kaye, Sault Ste. Marie, Ontario, Can., 1,277,220. Aug. 27, 1918. Filed June, 15, 1918. Serial No. 240,152.

Fuel Transfer Mechanism for Stokers. N. E. Gee, Altoona, Penn., 1,276,642. Aug. 20, 1918. Filed Dec. 29, 1913. Serial No. 809,349.

Mining Apparatus. C. J. E. Waxborn, assignor to Jeffrey Manufacturing Co., Columbus, Ohio, 1,276,141. Aug. 20, 1918. Filed Oct. 11, 1912. Serial No. 725,323.

Safety Gate for Mine Shafts. W. H. Finley, assignor Fairmont Mining Machinery Co., Fairmont, W. Va., 1,276,199. Aug. 20, 1918. Filed Feb. 19, 1918. Serial No. 218,054.

Process of Treating Coal. C. H. Smith, assignor to International Coal Products Corporation, Richmond, Va., 1,276,427. Aug. 20, 1918. Filed Jan. 20, 1916. Serial No. 73,106.

Burning Pulverized Fuel. V. Z. Caracristi, assignor Locomotive Pulverized Fuel Co., a corporation of Delaware, 1,274,384. Aug. 6, 1918. Filed Nov. 5, 1913. Serial No. 799,269.

Briquet and Method of Making Same. C. H. Smith, assignor to International Coal Products Corporation, Richmond, Va., 1,276,429. Aug. 20, 1918. Filed Nov. 15, 1916. Serial No. 131,434.

Ignition Tape for Miners' Safety Lamps. F. Fear, A. E. Naldrett and W. C. Nicodemus, assignors to Fred Fear Match Co., Bloomsburg, Penn., 1,275,543. Aug. 13, 1918. Filed Oct. 22, 1915. Serial No. 57,248.

Publications Received

Saving Coal in Boiler Plants. By Henry Kreisinger, Department of the Interior, Bureau of Mines. Technical Paper 205. Illustrated, 24 pp., 6 x 9 inches.

Thirty-first Annual Report of the Bureau of Mines, Mining and Mine Inspection of the State of Missouri. For the year ending, Dec. 31, 1917. Unillustrated; pp. 101; 6 x 9 inches.

Monthly Statement of Coal-Mine Fatalities in the United States, June, 1918. Compiled by Albert H. Fay, Department of the Interior, Bureau of Mines. Unillustrated, 27 pp., 6 x 9 inches.

Trade Catalogs

The Jeffrey Pit-Car Loader. Jeffrey Manufacturing Co., Columbus, Ohio. Bulletin 246. Pp. 8, 6 x 9 in., illustrated. Describes a light, easily portable loading conveyor which performs the most arduous work the loader has to do, resulting in a considerable saving of muscular energy and man power. The use of the loader decreases the cost of obtaining coal.

Industrial News

Centertown, Ohio—The authorized capital of the Centertown Coal Co. has been increased from $160,000 to $250,000.

Jackson, Ky.—The River Side Coal Co. has filed notice of an increase in its capitalization from $10,000 to $30,000 to provide for expansion.

Mechanicsville, N. Y.—William D. Tweedy, 56 Mabbitt St. is considering plans for the reconstruction of a number of coal pockets at his plant.

Russell, Ohio—The No. 6 Coal Co. has been chartered with a capital of $25,000 by D. A. Robinson, J. W. Burnett, B. J. Patch, H. W. Parker and H. A. McAuley.

Hazard, Ky.—The Hazard Coal Co. is having plans prepared for the reconstruction of its power plant recently destroyed by fire, with loss estimated at $5000.

Kilday, Ky.—The J. L. Smith Coal Co., capital $75,000, has been incorporated by J. L. Smith, George F. Noel and J. W. Farmer, and expects to develop coal properties.

Henderson, Ky.—The Charles T. W. Argue Coal Co., Henderson, capital $25,000, has been organized and incorporated by Charles T. W. Argue, W. H. Winstead and F. H. Harrison.

Lexington, Ky.—The Swift Coal and Lumber Co. is said to have acquired additional property in the vicinity of its local holdings, and is planning for early development work.

Houston, Tex.—The Texas Oil, Gas and Mineral Products Co. has been incorporated with a capital of $1,000,000 to develop coal, kaolin and silica deposits in Grimes County. W. C. Munn, Houston, is president.

Centertown, Ky.—The Centertown Coal Co., has filed amended articles increasing its capital stock from $160,000 to a quarter of a million in order to take care of contemplated improvements to increase production.

Chavies, Ky.—The Coneva Coal Co., at Chavies, one of the fast developing eastern Kentucky concerns, has filed amended articles of incorporation in which the capital is increased from $70,000 to $120,000.

Andover, Mass.—The M. T. Stevens & Sons Co. has awarded a contract to the New England Concrete Construction Co., 201 Devonshire St., Boston, for the construction of a new coal pocket at its plant, about 45 x 125 ft.

Chattanooga, Tenn.—The Chattanooga Iron and Coal Corporation is said to be having plans prepared for the immediate reconstruction of the portion of its plant recently damaged by fire, with a loss estimated at $20,000.

Hartland, W. Va.—The Clay County Fuel Co. has filed articles of incorporation with a capital of $100,000 to develop coal properties in Clay County. A. J. Peck, S. A. Moore and A. A. Lilly, all of Charleston, are the incorporators.

Fairmont, W. Va.—The Dawson-Connellsville Collieries Co. has been incorporated with a capital of $120,000 to operate

coal properties in the vicinity of Fairmont. G. G. Wedding, Carl Riggs and W. M. Kennedy are the principal incorporators.

Birmingham, Ala.—The Big Four Coal Co. has been formed with W. M. Holt, J. A. Carr and W. C. Davis as incorporators. The capital stock is $5000, and the company will engage in coal mining operations in this district.

Madisonville, Ky.—The Curtis Coal Co., which recently filed articles of incorporation with a capital of $50,000, is planning for the early development of coal properties in Hopkins County. Ray L. Curtis, of Madisonville, is president.

Washington, D. C.—The United States Government, Bureau of Yards and Docks, has awarded a contract to the Piel Construction Co., Baltimore, Md., for the construction of a new fuel depot at the Government station at Curtis Bay, Md.

Fairmont, W. Va.—The Diamond Coal Co. has been incorporated with a capital of $200,000 to engage in the development of coal properties in the Fairmont district. Warder Cresson, A. P. Brady and H. E. Engle are the principal incorporators.

Barbourville, Ky.—The Ideal Horse Creek Coal Co., recently organized, is planning to inaugurate operations at an early date on the development of approximately 100 acres of coal lands in the Crawfish district of Kentucky. G. D. Bengey is president.

Lansford, Penn.—The Lehigh Coal and Navigation Co. has awarded a contract to Charles H. Schlegel, Mt. Penn, for the construction of 20 new 2½-story, brick miners' residences. Calvin Young, 249 Jameson Place, Reading, is the architect.

Birmingham, Ala.—The Carbon Hill Consolidated Coal Co., of Carbon Hill, Walker County, has been incorporated with capital of $5000. The company was formed by S. R. Fowler and others, and will engage in mining operations in the vicinity of Carbon Hill.

South Bethlehem, Penn.—The Philadelphia & Reading Railroad Co. is taking bids for the construction of a new coaling station and pits in connection with other improvements at its yards at Saucon Creek. The new station will be of reinforced-concrete and steel.

Buckhorn, Ky.—The Buckhorn Coal and Lumber Co., capital $150,000, has filed amendment to its charter in which the capital stock is increased from $150,000 to $250,000 in order to develop properties and make contemplated improvements to increase production.

Memphis, Tenn.—The Memphis Gas and Electric Co. is planning to commence work at an early date on the construction of a new local coal and coke plant, to include a battery of 27 coke ovens, a number of concrete buildings, scrubber house and auxiliary structures.

New Waterford, Ohio.—The Canton Coal Co. has commenced work on the sinking of a new shaft at its local properties to provide for increased operations. Plans have also been prepared for the construction of a new power house at the plant for operation. J. E. Morgret is general manager.

Charleston, W. Va.—The Columbia Coal Co. has been incorporated with a capital of $90,000 to engage in the operation of coal mines in the Charleston field. C. H. Hetzel, Charleston; Charles A. Smith, Chillicothe, Ohio, and Herbert Hannigan, Lexington, Ohio, are the incorporators.

Clay, W. Va.—The Jones-Winifrede Coal Co., whose land is located at Hartland, in the Clay County field, has changed hands, E. E. George and other business men of Philippi having acquired the plant. H. C. Jones, of Logan, was one of those largely interested in the Clay County operation.

Charleston, W. Va.—The Burning Creek Coal Co., of Kermit, W. Va., has been chartered to operate mines in Mingo County. The capital stock is $10,000. Incorporators are: B. R. Bias, C. G. Bias and J. G. Nesbitt, of Williamson; G. R. C. Wiles, of Charleston, and Harry J. Jones, of Kermit.

Chicago, Ill.—The Chicago Pneumatic Tool Co. announces the appointment of A. G. La Pierre as traffic manager and F. O. Southbrook, as manager of the order and production department. The headquarters will be in the home office of the company, Fisher Building, Chicago.

Huntington, W. Va.—The Winifrede Railroad Co., which is a coal-carrying road operated by the Winifrede Coal Co., has been authorized to increase its freight rates from 15c. to 35c. per ton, according to announcement made by A. H. Land, district representative of the Fuel Administration.

Muskogee, Okla.—The Johnson & King Coal Co., Barnes Building, is planning for the immediate development of approximately 400 acres of coal lands at Clarksville, Ark., to have a daily capacity of about 250 tons. New mining machinery and equipment will be installed. Earl H. Johnson is president and manager.

Lynch, Ky.—The United States Coal and Coke Co., Carnegie Building, Pittsburgh, Penn., will build a 1-story (45 x 60) 132 ft. reinforced concrete bin, 40 ft. high, 20 ft. above ground, 45 ft. wide at a cost of about $100,000. Work will be done by day labor under the supervision of H. N. Eavenson, of Gary, W. Va.

Charleston, W. Va.—The Royalty Coal Co., of Morgantown, W. Va., has been incorporated with a capital stock of $50,000 to operate coal mines in Monongahela County. The incorporators are: Glen Hunter, Morris Clovis, Howard Swisher and Don K. Marchard, of Morgantown, and Jesse E. Moore, of Mooresville.

Charleston, W. Va.—The Equitable Byproducts Co., of Pittsburgh, Penn., has been incorporated with a capital stock of $90,000 to manufacture coke and other coal byproducts within the state of Pennsylvania. R. T. Rossell, Frank J. Young, E. C. McHugh, L. T. Sanders and F. L. Soles, all of Pittsburgh, are the incorporators.

Straven, Ala.—The Montevallo-Straven Coal Co., recently incorporated, has perfected its organization and is planning to commence work at once on the development of about 400 acres of coal properties in the Straven district with an initial capacity of 100 tons, to be increased ultimately to about 400 tons. F. E. Dunlap is president.

Charleston, W. Va.—The Big Six Coal Co., which has been successfully operated on Campbell's Creek, Kanawha County, has changed hands. H. T. Smarr and associates having acquired the holdings of the company from C. W. McNulty and others. Mr. Smarr will act as general manager of the mines acquired by him in the deal.

Columbus, Ohio—The G. C. Silcott Coal Co. has been incorporated with a capital of $25,000 by George C. Silcott, Mary A. Summers, Eva M. Silcott, R. M. Snetzer and D. H. Armstrong. The company succeeds the Silcott Coal Co., and will have larger offices on the ninth floor of the Brunson building. It will do a general jobbing business.

Radnor, W. Va.—The Burk Coal Co., Huntington, W. Va., has been organized to operate holdings in the Radnor district. The company controls the Radnor Coal Co. and the Laurel Creek Coal Co., and is considering plans for the construction of a new tipple and the installation of mining machinery for extensive development. John L. Corcoran is president.

Willard, Ky.—In connection with the extensive improvements planned by the Black Raven Coal Co., a large quantity of new mining machinery including coal-cutting apparatus, electrical equipment, screens, and other equipment will be installed. It is planned to have an ultimate output of approximately 1000 tons of coal daily. W. H. Norris is general manager.

Girdler, Ky.—The Steele & Alder Coal Co., recently incorporated with a capital of $18,000, has arranged plans for the immediate development of approximately 150 acres of coal properties in the vicinity of Girdler, to have an initial capacity of about 30 tons daily. New equipment for operation will be installed. W. B. Steele and Rex E. Steele, both of Pounding Mill, Va. are president and vice president respectively.

Chehalis, Wash.—Twenty-five of the city's most prominent business men held a conference recently for the purpose of interesting capital in the development of a plant for the crushing of coal which is abundant in adjacent fields and using it in powdered form at local industrial institutions. N. B. Coffman, A. C. St. John ad W. A. Shoell are prominent in the movement, as well as President A. Campbell, of the Superior Coal Co.

New York, N. Y.—Among recent contributors to the Coal Trade Liberty Loan Committee quota for the purchase of Liberty Bonds are J. E. Berwind, $150,000; Porto Rico Coal Co., $100,000; New Central Coal Co., $25,000; Weber, McLaughlin Co., $15,000; Gavin Rowe, $10,000; Scranton & Lehigh Coal Co., $117,000; Tuttle's Son & Co., $50,000; Bacon Coal Co., $30,000; Delaware, Lackawanna & Western Coal Co. (additional), $1,000,000; and Wilputte Coke Oven Corporation, $53,050.

Charleston, W. Va.—The Clay County Fuel Co., Kanawha National Bank Building, recently incorporated with a capital of $100,000, is planning to commence work at once on the development of approximately 600 acres of coal properties in the vicinity of Hartland. It is proposed to have an initial capacity of about 100 tons daily. William T. George, Philippi, W. Va., is president; A. A. Lilly, A. J. Peck, and S. A. Moore, all of Charleston, are first vice-president, second vice-president and secretary-treasurer, respectively.

Charleston, W. Va.—The Capital issues Committee has approved an issue of $150,000 of 7 per cent, sinking fund gold notes of the Eagle Byproducts Co., the proceeds of which will be used by the company to provide for extensive improvements and additions at its mines in the Paint Creek district, to increase the present capacity. It is understood that the coal produced by the company is in great demand for byproduct purposes, and the company is understood to be planning to increase the output ultimately to approximately 2000 tons daily.

Denver, Colo.—Arrangements are being rapidly completely by the Delaware holding company of the Western Pacific R. R. of California to legally assume ownership and control of the Utah Fuel Co., of Utah. This is a new and big asset for the stockholders, it having been recently set aside for them by the Denver Federal Court in part payment of their $38,000,000 court-affirmed debt against the Denver & Rio Grande R. R. The Utah Fuel Co. owns 26,000 acres of coal lands, which are estimated to contain 170,000,000 tons of coal. Some 800 coke ovens are now at work on the property.

Cleveland, Ohio—The Elliott Electric Co. has removed from 322-328 Champlain Ave. to 813-815 Superior Ave., N. W., where it occupies the entire five floors and basement. The first floor is occupied by the retail store and supply department office. The second floor is devoted to the general office and the machinery department office. The repair shop for the repairing of motors is located on the fourth floor. The remaining floors and basement are utilized to accommodate the large stock of motors and electrical supplies. The retail store is being remodeled, and when completed will be the largest in Cleveland.

Toledo, Ohio—The movement of coal to the upper lake regions from the Toledo docks is going ahead actively. The vessel movement is generally good and those in charge of the lake trade believe that the quota for the Northwest will be reached before the close of navigation. The Hocking Valley docks during the week ending Oct. 5 handled 188,000 tons as compared with 200,000 tons the previous week, making a total of 3,876,000 tons since the season opened. The Toledo & Ohio Central docks during the same week loaded 92,000 tons as compared with 85,000 tons the previous week, making a total of 1,699,000 tons for the season.

New York, N. Y.—The Anthracite Committee of the United States Fuel Administration has announced the 1918-1919 coal allotments for 1650 communities in the State of New York. The total tonnage in domestic sizes for the state is 15,855,300 tons, which is a 12 per cent. increase over the previous year's distribution figures. New York City gets 8,005,975 tons this year, or 872,567 tons more than during 1916-1917. Up the state there are 239 places which get no anthracite; 1345 towns that receive tonnages ranging up to 15,000 tons; 20 communities get over 15,000 tons; 18 places receive over 25,000 tons; 16 over 50,000 tons and 11 cities receive over 100,000 tons each. Rochester receives 599,865 tons; Buffalo, 599,015 tons; Syracuse, 380,212 tons, and Albany 296,058 tons.

Kansas City, Mo.—The investigation into retail coal dealing in Kansas City, conducted by Gregg & Co., of St. Louis, at the instance of the local dealers, has had incidental benefits, in addition to its usefulness in negotiations with the Fuel Administration. One of these beneficial features is the disclosure of inefficient business methods to some of the dealers. In some cases, for instance, the accountants discovered that dealers were making quite inadequate allowances for overhead; in other cases, the owners of the business were not allowing themselves any salaries. Two or three dealers were making no charge to their coal business, for rent of ground owned by themselves, though such rental charges appeared concerning ground which they leased for their coal purposes. In several instances coal dealers were carrying their property on their books at an antiquated value. There were numerous other such factors disclosed, which had prevented the dealer from figuring accurately and honestly on his costs of doing business.

MARKET DEPARTMENT

Weekly Review

Soft Coal Output Well Above Weekly Requirements—Anthracite Production Shows Slight Decrease—Labor Shortage and Poor Car Supply in Bituminous Regions—Influenza Epidemic Affects Hard Coal Output—Zoning Restricts Movement of Illinois Coal

REACTING to the drive for greater tonnages now being made by the Production Division of the Federal Fuel Administration, the bituminous mines during the week ended Oct. 5 shipped 12,585,000 net tons of coal. Though this output is a decrease of 462,000 net tons as compared with production the week preceding, the total not only exceeds the weekly requirements of the country by 4 per cent., but helps to make up 3.2 per cent. of the existing soft coal shortage. Anthracite production during the same week totalled 2,052,000 net tons, a decrease of 19,000 net tons as compared with output the week ended Sept. 28.

Labor shortage and poor car supply, the two bugaboos of the soft-coal operator, are again noticeably to the fore in the bituminous regions. The Fairmont district of West Virginia is one of the sections that by a scarcity of cars has been heavily handicapped in its efforts to meet production quotas. As an aside, it may be particularly appropriate to recall that the Railroad Administration not so long since emphatically stated that all mines would receive a 100 per cent. car allotment based on new ratings, and that cars would be moved to and from the mines with maximum speed and efficiency. So much for promises! Other soft coal producing sections, not so unfortunate as far as cars are concerned, complain of a shortage in man power and are troubled by labor that is restive and too prone to holiday-taking. As contrasted with other years, however, the mine workers have responded well to the demands made upon them.

In the anthracite region production is being seriously curtailed by the influenza epidemic. The disease has already necessitated the closing down of several large collieries, and hardly an operation but has a number of its employees on the sick list. It is estimated that daily production is being reduced from 25,000 to 35,000 tons from this cause, and all possible efforts are being made to prevent the further spread of the disease.

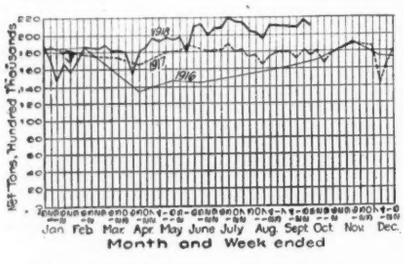
The most carping critic must now admit that the Fuel Administration has amply justified its reason for being. In control of all production and distribution facilities, the Administration has brought to fruition the many plans which it formulated early in the year for safeguarding the nation's fuel supply. In the face of apparently insurmountable obstacles and scathing sarcasm from many quarters, Dr. Garfield and his assistants have steadily labored until chaos has given way to order; and it is gratifying to record that New England and a number of other important industrial centers report ample reserve stocks of fuel against the uncertainties of winter mining and shipping conditions.

There is one phase of the distribution system, however, which seems to demand consideration. The mines in the Standard and Mt. Olive fields of Illinois are confronted with a serious predicament. Consumers who receive their coal supply from these fields have stocked up with fuel to such an extent that the mines in these districts now have no market for their product. At the same time parts of Iowa, Nebraska, the western part of Missouri and certain northern sections would gladly purchase Standard or Mt. Olive coal, but unfortunately zone restrictions prevent the movement of Illinois coal to these localities. It would appear as if a readjustment of the zoning regulations insofar as they apply to Illinois coal would prove of advantage not only to the mines affected, but would also enable certain sections of the Middle West to obtain a much-needed coal supply.

Only the premature closing of the Lake season by severe weather will prevent the Northwest from receiving its allotment of 28,000,000 net tons of bituminous coal by way of the Great Lakes. October, according to the Fuel Administration's schedule, is only a 3,500,000-ton month, yet in the period from Oct. 1 to Oct. 7 a total of 1,006,954 net tons of soft coal, not including vessel fuel, was loaded at the lower lake ports. At this rate the entire deficit for the season to date would be wiped out by Nov. 1.

WEEKLY COAL PRODUCTION

The output of bituminous coal during the week ended Oct. 5 decreased 462,000 net tons, or 3.6 per cent. compared with the week preceding, but exceeded production during the week of Oct. 5, 1917 by 1,774,000 net tons, or approximately 16 per cent. Estimates placed production (including lignite and coal made into coke) at 12,585,000 net tons as compared with 13,047,000 net tons during the week ended Sept. 28, and as against 10,811,000 net tons during the corresponding week of 1917. The average production per working day during the current week is estimated at 2,097,000 net tons, 78,000 net tons lower than the daily average during week of Sept. 28, but 295,000 net tons in excess of the daily average of the same week last year. The production during the week of Oct. 5 while considerably lower than the week preceding, exceeded the weekly requirements by 4 per cent. and the weekly requirements to make up the past deficit by 3.2 per cent.



Production of anthracite during the week ended Oct. 5 is estimated at 2,052,000 net tons, a slight decrease compared to the week preceding and the same tonnage as produced during the corresponding week of last year. Daily average is estimated at 342,000 net tons as compared with 338,000 net tons for the coal year to date, and as against 331,000 net tons during the same period of 1917. The total production for the coal year to date is estimated at 53,703,000 net tons, an increase of approximately 2 per cent. over last year.

Shipments of bituminous coal to New England during the week ended Oct. 5 were extremely heavy and exceeded the coal received by New England during the preceding week by 137,339 net tons, or approximately 30 per cent. Preliminary estimates place shipments during the week at 588,105 net tons, of which amount 180,576 net tons was received by rail through the gateways and the balance of 407,529 net tons comprised water shipments. The rail receipts exceeded the previous week's tonnage by 3 per cent. while the increase in tidewater shipments amounted to 47 per cent. all harbors reporting considerable improvement. Rail receipts during the current week, however, fell 15 per cent. below the weekly average of the coal year to date, while tidewater shipments exceeded the weekly average by 18 per cent.

Increased shipments from Baltimore during the week ended Oct. 5 caused total shipments from tidewater harbors to exceed the performance of the week preceding by 36,365 net tons. Shipments from all harbors during the week amounted to 953,158 net tons, of which total New York and Philadelphia shipped 452,091 net tons, Baltimore 117,509 net tons and Hampton Roads 382,748 net tons. Shipments from New York and Philadelphia exceeded the shipments from the same ports during the week ended Sept. 28, while shipments from Hampton Roads fell slightly. Shipments from all ports except Hampton Roads during the current week exceeded the weekly average for the coal year to date, while Hampton Roads fell behind 7 per cent.

Production of beehive coke coal during the week ended Oct. 5 is estimated at 572,000 net tons, a decrease compared with the week preceding of 38,000 net tons, or 6.3 per cent. The average production per working day is estimated at 95,000 net tons as compared with 102,000 net tons during the week ended Sept. 28. The operators of the Connellsville, Greensburg and Latrobe

CARLOADS OF COAL ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS

	Week Ended Sept. 14	Sept. 21	Sept. 28	Oct. 5
Bituminous shipments, 123 roads	223,131	223,631	230,376	222,704
Anthracite shipments, 9 roads	40,699	36,859	40,524	38,550

districts of Pennsylvania report production of beehive coke during the week ended Oct. 5 at 376,433 net tons and the operation of their plants at 75.5 per cent. of their full time, as compared with 76.4 per cent. during the week preceding. Shortage of yard labor increased slightly during the week.

Conditions in the byproduct industry changed but little during the week ended Oct. 5 as against the preceding week. The operators in the United States of byproduct ovens report production during the week at 585,216 net tons and the full time operation of their ovens at 91.9 per cent. as compared with 92.2 per cent. during the week preceding; and of total losses of their full time of 8.1 per cent., 1.3 per cent. is attributed to lack of coal, 1.3 per cent. to labor shortage, 4.8 per cent. to repairs to plants and 0.7 per cent. to all other causes.

Material improvement occurred during the week in Kentucky and West Virginia. In the former state the operators attributed the improvement to repaired plants while no reason was given by operators for improvement in the latter state. A decrease in production occurred in Maryland, Minnesota, New York and Tennessee. Shortage of labor limited production in Maryland and New York, and repaired plants in Tennessee, while the operators in Minnesota attributed their limited production to other causes.

BUSINESS OPINIONS

The Iron Age—Pig iron was produced in September at 113,942 tons a day, the highest rate in the history of the industry, representing a gain of 4600 tons a day over that of August. The September total was 3,418,270 tons, against 3,389,585 tons in August. Yet 14 furnaces blew out last month and seven blew in, making a net loss of seven. The total in blast Oct. 1 was 365. Ferromanganese and spiegeleisen production went above 66,000 tons last month, or about 12,000 tons more than the best previous record. The manganese situation is easing beyond expectation.

Dry Goods Economist—Dry goods business at retail is above normal in many centers, despite the handicaps caused by the spread of influenza and the fact that merchants everywhere are striving to boom the Liberty Loan, in some cases devoting their entire advertising space to the drive. The Government's cotton crop estimate as revised this week indicates a total yield of 11,818,000 bales, a gain of 681,000 bales over the last previous estimate. The increase is attributed entirely to favorable weather in the cotton belt. Prices of raw cotton continue to recede slowly.

American Wool and Cotton Reporter—Wool is arriving all the time at the Boston market from South America and South Africa, and is being put through the Government "machine" as rapidly as possible. Facilities for transporting wool from the wharf to its destination are not very good. Many mills have run out of civilian orders. Others would like to get wool for civilian purposes but are unable to do so because they are not on Government work. Some mills are running with only 60 per cent. of their operatives on account of the influenza epidemic. There has been perhaps a little more buying of cotton on the part of the mills since the decline in prices, but this has been slight.

Bradstreet's — Cumulatively, favorable war news has stimulated the bond market, raised the levels of peace stocks, and begotten false peace sentiment, against which the President has issued a caution. Peace talk, too, has had some effect on trade, which reflects some hesitation, and the pace of industry has slackened, but some responsibility for this is credited to the country-wide epidemic of influenza, which has hampered industry, resulted in the promulgation of health regulations, the closing of some theaters and schools, and finally in restricted buying by the ultimate consumer. The Liberty Loan campaign also has diverted attention from trading, and pleas for peace emanating from the central European belligerents have brought on a more cautious attitude among buyers.

Atlantic Seaboard

BOSTON

Receipts both all-rail and by water still further reduced. Several modern colliers withdrawn from coastwise service. Nothing but light shipments in prospect. Hampton Roads detention less severe, due partly to fewer arrivals. Bulk of Pocahontas output still moving for line and byproduct use. Meanwhile, long lists are issued laying embargoes against plants served both all-rail and from tidewater distributing points. Condition works hardship on regular shippers. Increased shipments overseas in evidence. Baltimore loadings diminish. South Amboy embargoed for a time and only a light tonnage dumped over the Philadelphia piers. Anthracite receipts, both domestic and steam sizes, also diminish. Storrow anthracite comes forward irregularly.

Bituminous—Shipments generally have shown a notable falling off the past fortnight. All-rail receipts, as compared with a month ago, are on the average 20 per cent less, or approximately 150 cars less daily at the five gateways. For the first eight days of October the average number of cars passing was but little over 600 per day, railroad fuel included. Movement of the latter has somewhat increased, so that the reduction in commercial receipts all-rail is greater than 20 per cent. Not only have embargoes been liberally applied against New England consignees, but the latter of their own motion are shutting off deliveries on contracts that were entered into early in the season. The scarcity of labor to unload cars, the difficulty of adding to stocks already piled high, and further the knowledge that coal is now relatively easy to get are all factors in the current situation. New England has practically a four months' reserve, and now that current requirements can be had the all-rail buyers in particular are disposed to look upon fuel needs the coming winter as a problem already solved. Certainly, if we reach Nov. 15 without shipments being cut down too radically this complacent attitude will be amply justified.

The recent withdrawal of several large modern colliers has shown the trade how quickly it is possible for a reaction to set in. It has long been anticipated that for volume shipments abroad it would be necessary to use still more of our fast self-trimming steamers for overseas work, replacing them so far as possible with old type of slow-going boats that would have small chance of escape in submarine zones on the other side. It is understood that shipments must now begin to increase very fast to meet urgent needs in France, Italy and other allied countries, but not until lately was it thought prudent to deprive New England of the coal such a move would mean.

It is a time, however, when deliveries can be diminished with entire safety, although from the standpoint of New England and the flow of coal to tidewater, especially at Hampton Roads, will have to be followed more closely than a few weeks ago was thought would be necessary. The fact that the very largest consumers, the railroads and other utilities, have less in reserve than the average of the industries, will make it very important to see that there is no protracted breaking down in loading at the Virginia terminals. The extent to which receipts here fall off the next month will be interesting to observe.

Dispatch has improved at Hampton Roads. Where a week ago it was taking four to eight days to load bottoms, the average detention is now down to two days, and in some cases less. One day at Lamberts Point the proportion of coal available to boats waiting was about 40,000 to 90,000 tons, a better showing than had been the case for several weeks. The situation will probably show further improvement as there are fewer arrivals. The withdrawal of so many colliers from the coastwise service will mean a considerable reduction in the number of bottoms to load, from week to week. Byproducts requirements will of course continue heavy, and the large tonnage of Pocahontas and other coals moving west, along the line, and for other purposes will mean a large decrease in the tonnage handled over the piers.

While these factors will operate to reduce shipments here the fuel authorities are busy drawing up lists of consignees to whom further shipments should be discontinued. Not only does this apply against coal routed all-rail, but similar lists filed with shippers and forwarders who have both coal and facilities for deliveries inland. In several cases the result has been a distinct hardship to the agencies concerned. There are instances where shippers having their coal forwarded via the New York piers in regular course were not only obliged to move the coal later via Baltimore but were forced to stand heavy requisitions against it in favor of the New England Fuel Administrator, for distribution as the latter elected. The shipper had contracts outstanding with New England consignees who from time to time have been persuaded to take on coal shipped by the New England Fuel Administrator up to a point where the latter decided no further coal should go forward. For the same reason the fuel authorities cease to have coal at Baltimore or elsewhere requisitioned in their favor. The result is that the regular shipper now has his coal on his hands. His customers with whom he has contracts are not permitted to take coal from him, and as to the ultimate disposition of such cargoes as have arrived or are in transit the New England Fuel Administrator is without helpful advice. In other words, the shipper has his coal withheld from him while there is a ready market, but after fuel is no longer in urgent request and arbitrary stock limits are clamped on he is told he may have his coal for such distribution as may be acceptable to the Fuel Administration. When it is urged in some quarters that the game has been played with great skill, the average shipper is in position to answer, "Yes, but you had all the trumps."

Baltimore loadings have sloped off for New England, but there as elsewhere there is in evidence an increased volume of coal for naval and oversea use. The movement to South Amboy was so heavy a week or so ago that further shipments were embargoed to relieve congestion. The same thing was true of the Philadelphia piers, where the recent withdrawal of Reading barges to load at Port Reading rather than at Port Richmond has made a distinct difference. The port of Philadelphia will from now out show a notable falling off in coal clearances.

Anthracite—There is a further sag in the receipts of domestic sizes. In this respect the 50 cars daily of "Storrow anthracite" seem not to mean any increase in deliveries. Apparently this "free" coal is being used mostly to make up arrears of "independent" shippers, usually at the expense of retailers who depend upon the companies who have proved the more reliable sources of supply. The volume of steam sizes has fallen off very largely, due doubtless to the easy situation with regard to bituminous.

The "50 cars daily" of Storrow anthracite come forward more or less irregularly, and are subject to the same discount in actual shipments that has been true of similar arrangements for bituminous. It is hard to get accurate data, for up to the present writing no statement has been given out.

NEW YORK

Anthracite situation active, but domestic sizes are scarce and in heavy demand. Dumpings decrease owing to New Jersey explosion. Dealers must deliver more egg and pea to take place of stove and chestnut. Shipments to New England to be hurried. Bituminous situation easy, with commercial coals in good shape. Railroads continue to take fuel.

Anthracite—The situation continues active, with domestic sizes scarce and the demand heavy. Dealers report that there has been no let-up in the call for fuel and that the outlook is one of continual activity throughout the winter.

Shipments here fail to show an increase consistent with the demand. On the contrary the dumpings for the week closing Oct. 11 show a heavy decrease as compared with the previous week, not altogether the failure of shippers, but because of the disastrous TNT explosions at Morgan, N. J., on Oct. 5, not far from the coal piers and which interrupted work at South Amboy for two days because the workers could not be reassembled. During the period of seven days there were 5154 cars of anthracite dumped at the various piers, a falling off of 1403 cars from the previous week. The local trade as well as the nearby New England trade were seriously affected by the lack of shipments, but hopes to be able to make it up by increased tonnages which must be sent here if the allotment is to be maintained.

Acting upon the advice of Fuel Administrator Storrow of New England, the Anthracite Committee has requested producers and distributors to see to it that various communities in Massachusetts that receive the larger part of their fuel by water shall receive it by Dec. 1 and that weekly reports be sent to the committee by the shippers showing what progress has been made in that direction.

New efforts to conserve fuel are being announced almost daily by State Fuel Administrator Cooke. Dealers have been instructed to restrict sales to those living outside of communities who either have standing or cut wood available for fuel purposes. Mr. Cooke has also announced that in view of the demands of the War Department for stove and chestnut coal for use in camps and cantonments retailers will have to supply their customers with larger proportions of egg and pea coal.

Dealers continue to receive a larger supply of broken than usual to take the place

of egg and stove. The supply of the sizes below pea steadily increases and there has been some cutting of prices by individuals. The companies are taking advantage of the situation to send some to the storage yards.

Current quotations, per gross ton, f.o.b. tidewater, at the lower ports are as follows:

	Circular	Individual		Circular	Individual
Broken	$6.75	$7.50	Buck	$5.10	$5.90
Egg	6.65	7.40	Rice	4.65	5.10
Stove	6.90	7.65	Barley	4.15	4.30
Chestnut	7.00	7.75	Boiler	4.60	
Pea	5.50	6.25			

Bituminous—The bituminous situation is easy, with plenty of commercial coal here to meet all current needs. Receipts have been below the average but there has been no anxiety on that account.

At the local piers there were 5507 cars of bituminous dumped during the week ending Oct. 11 as compared with 6666 cars the previous week, a decrease of 1159 cars. Much of this shortage was, however, due to the discontinuance of operations at the South Amboy piers on Oct. 5 and 6, because of the New Jersey explosions.

For the week ending Sept. 28 there was a considerable decrease of shipments of bituminous coal to New England from this harbor, Government statistics showing a falling off of 14.8 per cent. as compared with the preceding week. However, shipments to all points increased 4 per cent. over the previous week.

Some results of the application of the Government "lightless" night order have been announced. One of the electric light companies operating in Brooklyn reports having saved 6300 tons of coal as the result of the 184 lightless nights since the order went into effect.

The railroads continue to take coal for their needs, but according to some shippers are not paying the bills promptly. Considerable inconvenience has been caused by the action of the railroads on account of the seizure of the coal, consumers who were in urgent need of fuel having been made to hustle in the open market for coal.

Locally the situation is all that can be desired. There is plenty of commercial coals to meet all necessary needs but no surplus for outside calls. Bunker fuel is comparatively easy with enough to take care of demands.

Current quotations, based on Government prices at the mines, net ton, f.o.b., tidewater, at the lower ports, are as follows:

	Mine Gross	F.o.b. N. Y. Gross
Central Pennsylvania:		
Mine-Run, prepared or slack	$3.30	$5.45
Upper Potomac, Cumberland, and Piedmont Fields:		
Run-of Mine	3.08	5.23
Prepared	3.36	5.51
Slack	2.80	4.95

Quotations at the upper ports are 5c. higher.

PHILADELPHIA

Anthracite activity shows no abatement. Dealers deliver short orders. Efforts to move egg and pea. Tonnage below expectations. Full quota assured, but epidemic causes decrease. Good preparation. Steam coals begin to regain strength. No demand for culm. Bituminous in good supply. Coal well distributed. Big plants still embargoed.

Anthracite.—The cool weather brought unusual demands upon the dealers, but by following the suggestions of the local fuel administration considerable headway was made in supplying homes that had no coal. With the increasing severity of the influenza epidemic homes in which there was sickness were given preference, and in many cases where dealers had short supplies the delivery of fractions of tons was resorted to for the first time in many months. This week finds the market unusually short of stove and chestnut, and where any stocks exist they are invariably egg and pea coal. The public shows little tendency to take any but the preferred sizes. In order to change this situation as much as possible Mr. Lewis has just furnished every dealer with a placard calling the attention of the public to the shortage of stove and nut and stating that they are being consigned to the army cantonments, etc. The public is appealed to to use as a substitute a mixture of 60 per cent. egg and 40 per cent. pea. A list of instructions as to how to burn this combination in any heating apparatus is also supplied, and the dealers are expected to induce their customers to change their orders to move these two laggard sizes at this time. Those who call at the dealers' yards are impressed with the official appeal and realize the seriousness of the situation, but as most of the buyers beg for their coal over the telephone the dealers are having much trouble with this class. For this reason it is hoped the fuel administration will use the daily press to help educate the public as to conditions.

The largest shipping company which was compelled to neglect this market last month is consigning much more coal here now. As a whole the tonnage coming into Philadelphia so far this month has been disappointing. The heavy consignments promised to the suburban dealers, who were to have an increase of 10 per cent. immediately, are also much below expectations.

There is an increasing confidence expressed at the offices of the different shippers that the Philadelphia dealers will receive their full quota based on the 1916-17 estimate, plus the increase allowed by the anthracite distribution committee. Naturally the dealers are all growing anxious and impatient and like the householders want to see the coal. From all we can learn we are satisfied that after Nov. 1 the receipts will be heavy, and that by that time the dealers will be more concerned about getting the coal out of their yards than into them. In fact the labor question is growing so serious that by the time severe weather arrives we expect to see much coal bought at the yards, with the consumer arranging for the delivery as best he can. More coal is stored in the cellars than ever before, but the large class of one-ton buyers for the small homes, who always wait until coal is needed, are sure to have trouble in being supplied.

We have made it a point recently to inspect coal as to its preparation as received from various shippers. From personal observation we are of the belief now, when scarcely a dealer would be critical, that coal is coming to market in better shape than in normal times. It is quite true that the larger companies are particularly careful.

The closing of the churches, schools, theatres, etc., on account of the influenza epidemic has been the means of saving much fuel this week, as the weather has been so cool that heating of such buildings would have been necessary.

There is a noticeable bracing in the steam coal market. As a matter of fact the break of a week or ten days since was only felt by the larger shippers. These concerns actually ran into storage yards a considerable tonnage of the sizes below buckwheat. While the market even now cannot be said to have regained its former vitality, still there is a quick market for all of the buckwheat coal that is coming out and almost as much can be said of rice coal. With the sizes smaller than rice there is still a considerable tendency to slackness, but it is thought from now on this will gradually wear away until an active demand is in evidence for every size, with the possible exception of culm. This latter material has not shown any tendency yet to become in active demand. Even with the biggest shippers there is only a stray car called for, mostly in the way of a test by some concern which has not yet tried it. The exemption ruling as to buckwheat has again been placed by the fuel authorities, and it is doubtful whether it will be lifted now until the season is well advanced toward spring.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken	$4.90	$6.25	Buckwheat	$3.40	$4.45
Egg	4.80	6.15	Rice	2.90	3.80
Stove	5.05	6.40	Boiler	2.70	3.70
Nut	5.15	6.50	Barley	2.40	3.30
Pea	3.75	5.00	Culm	1.25	2.15

Bituminous—There is a growing feeling that the bituminous situation is being mastered. At any rate every plant seems now to be getting along without a great deal of difficulty in procuring supplies and most of them are even able to accumulate a little stock, which is the condition being striven for by the distribution committee. Practically all of the big users which had succeeded in getting stocks of 60 days or more in advance are still being embargoed until they reach a 30-day minimum, when they will again be allowed to receive coal.

BALTIMORE

Influenza demoralizes all lines of business. Soft coal continues easy but of poor grade. No relief, despite urgent call, in regard to anthracite.

Bituminous—There is hardly a coal office in Baltimore that has not been hit by the influenza epidemic. All lines of business are more or less demoralized in a city that for days showed from 1500 to 2500 new cases of the disease a day, and a death list of around 100 daily from influenza and pneumonia. The supply of soft coal continues easy here. The main run continues in box-cars, and despite the big meeting in western Maryland recently in the interest of cleaner coal from that section, as well as from West Virginia and western Pennsylvania, in only one line of movement, coal for loading for eastern shore of Maryland points, was any improvement in grade to be noted. The poor run of soft coal is shown in the fact that the fuel administration here has been unable to get even a fair grade of bituminous for the domestic trade, which had been generally advised to push a high class lump soft coal as a substitute for the anthracite that has not arrived.

Anthracite—Baltimore is still in the throes of disappointment as to any possibility of adequate hard coal supply. There is apparently little hope of immediate improvement, and all the appeals of the city to Washington, backed by facts to show that thousands of homes here are entirely out of coal and have no prospect of getting even a little before real winter comes, have fallen on deaf ears, as far as results go. The fuel administrator of Maryland and the chairman of the city committee spent some time in Philadelphia this week in an effort to rustle up a little coal, having been informed that some mining connections with headquarters there were unable to understand why Baltimore was so desperately short when New York is reported fairly well supplied, at least in some boroughs. Philadelphia has enough to meet early requirements, and Washington dealers in some cases have actually been asking that shipments be held up a time as they could not handle all the coal coming through. The statement, therefore, that Baltimore is estimated to have between 30,000 and 40,000 homes entirely without coal, with more than 200,000 tons of undelivered orders on the books and a big tonnage asking recognition here, is hard of understanding. Many of the yards here were without a pound of coal last week, and some dealers had received no coal for a week or more, and then only small amounts.

Lake Markets

PITTSBURGH

Car supplies sufficient, production being limited by labor performance. Low sulphur specifications.

After attending a conference in Washington of the fuel production managers, R. W. Gardiner, production manager for the Pittsburgh district, states that there has been a sufficient car supply for two months past and that the matter of coal production is one of getting the miners to work harder. Fully 20 per cent. of the men employed in the coal industry have enlisted or been drafted, and those who are left must work harder. Much difficulty has been encountered in getting men to work full time, and to work immediately after pay day.

Production of the Pittsburgh district continues on the increase, with car shortages reported only occasionally, but with labor shortage in evidence almost everywhere. Lake shipments are fairly heavy and with the rerouting of vessels to the "fast docks" recently decided upon the full complement of lake shipments may be reached, but only by continuing the movement to the end of the navigation season. Essential industries are well supplied, but there is still no opportunity to stock.

A movement has started among coal operators to increase the limit on low sulphur coal from 0.05 to 0.06 per cent., and this meets with opposition of the steel producers as they have difficulty in meeting the low sulphur requirements in certain government contracts.

Coal jobbers are doing scarcely any business, as consumers who would be allowed coal are generally taken care of by the Fuel Administration; and the zone system greatly restricts the opportunity of jobbers to act. The market remains quotable at the set limits: Slack, $2.10; mine-run, $2.35; screened, $2.60, per net ton at mine, Pittsburgh district, with 15c. brokerage allowed to be charged in addition by recognized brokers.

Recently the local fuel administrator called upon the local distribution manager for 450 carloads of coal weekly additional for retail dealers. As the coal could not be found except by taking it from lake shipments, the matter was put up to the Washington authorities, and as a result of an investigation by a field representa-

tive permission has been given to divert 200 carloads weekly. It is expected that this will take care of the matter temporarily, with the larger supply in prospect when the lake seasons ends.

BUFFALO

Bituminous growing easier. Anthracite not so plenty. Authorities claim that it is sufficient. October more favorable than September.

Bituminous — The trade goes on much the same, though the complaint of shortage is mostly from consumers who have suddenly been deprived of their supply by priority orders. As soon as any concern which has been receiving coal regularly finds it sent to someone else, he sends out complaints to all who are in authority and usually succeeds in getting shipments again. It would seem that a more even distribution would save a large amount of turmoil and complaint. As the output is steadily reported as a good percentage over last year, it would seem to need a very severe winter to produce a famine.

Reports from Canada are conflicting. If a consumer or a town is short it seems to be the practice to claim that the shortage is general, but a well-known dealer of Montreal now in Buffalo says that the situation is easy in his territory. A month or more ago he complained of shortage. At the same time all districts will take all the coal they can get. Recent trips through the state eastward and northward find a pretty good supply in the yards of consumers.

Bituminous jobbers are not generally increasing their business. A few are doing pretty well, while most of them are merely waiting for old conditions to return. There must be a surplus of coal before the middleman is active, and that may be far away. There is complaint that the authorities have made vague promises to help them, but are allowing the trade to fall into the hands of the zone distributors.

Prices, as prescribed by the Fuel Administration, remain at $4.65 for thin vein Allegheny, all sizes, $4.45 for Pittsburgh lump, $4.20 for Pittsburgh mine-run and slack, all veins, $5.85 for smithing and smokeless, $5.60 to $6.10 for cannel, all per net ton, f.o.b. Buffalo.

Anthracite—The complaint of increased shortage through the city continues. In all instances where requests were for coal to be sent to families having the influenza the supply was sent promptly. So it is hard to say whether the city really is badly off or not, though practically every dealer will say so. It will take actual cold weather to determine that.

The list of cargoes loaded to the lake trade shows a number of ports which commonly receive only a single cargo a season, in which case there is usually no freight rate, the coal being bought here by the consignee. The amount for the week is large—122,200 tons—of which 35,800 tons cleared for Duluth and Superior, 31,300 tons for Milwaukee, 16,000 tons for Fort William, 10,100 tons for Chicago, 7200 tons for Ashland, 6400 tons for Escanaba, 6000 tons for Port Arthur, 3200 tons for Racine, 3000 tons for Shebovgan, 1800 tons for Kenosha and 450 tons for Saugatuck.

Freight rates continue at $1 to Racine and Kenosha, 60-65c. to Chicago, 55c. to Milwaukee, 50c. to Shebovgan, 48c. to Duluth, Ashland, Fort Williams and Port Arthur.

CLEVELAND

Withdrawal of all Baltimore & Ohio cars from Ohio coal mines and their transfer for use from the Fairmont field of West Virginia to tidewater is the outstanding feature of the coal situation here. Other roads are seeking to plug up the hole, but the loss in tonnage, especially to the lakes, will be distinctly felt. Labor continues the limiting factor, generally. Coal for domestic purposes has been a trifle more free.

Bituminous—Official notice that the Baltimore & Ohio R.R. would supply no coal cars to Ohio mines in the last half of the week ended Oct. 12 put a decided damper upon the industry. The lake trade is the greatest sufferer, though car supply on the other lines has been increased as much as possible to fill the gap. But even with this loss, car supply is less a limiting factor than labor. Industrial consumers are getting a trifle less coal than they were a week ago, while the domestic trade is benefiting. As against 15 to 20 per cent. of its needs, the retail trade is getting 30 to 40, for the time being.

Anthracite—Occasionally a small lot of anthracite filters through the blockade the zoning system has been put into effect, but receipts for the domestic trade may be said to be negligible. Complaint still is heard from upper lake dock operators to the effect that their quota of anthracite is far from filled.

Lake Trade—Only some unforeseen contingency, such as an early closing of the lake season by a premature winter, can keep the Northwest from getting its desired 28,000,000 tons of bituminous via the Great Lakes, is the consensus of opinion of the better-informed lake coal shippers. October, for example, is only a 3,500,000-ton month according to the Federal Fuel Administration's schedule, yet in the period of Oct. 1-7 a total of 1,006,954 tons of bituminous, not including vessel fuel, was loaded at lower lake ports. At this rate the entire deficit for the season to date would be wiped out by Nov. 1. Operators further point out that no shipments at all are scheduled for December, while in December, 1917, the lake fleet took up more than 660,000 tons. Oct. 9 proved to be the biggest coal-loading day of this season, when a total of 4401 cars, or 219,500 tons was loaded. Diversion of coal cargoes at the head of the lakes from slow to fast dock continues, and complaints of operators against this precedure are decidedly softened.

DETROIT

Efforts to supply the needs of domestic consumers hold the attention of dealers. Speeding of anthracite is promised. Lake trade continues heavy.

Bituminous—Detroit's supply of bituminous suitable for household use is not being increased to the extent that dealers expected it would be from the recent change in regulations governing zone shipments. The explanation is offered by jobbers that domestic lump and other prepared sizes, owing to priority orders, are finding their way into the lake trade.

The change in zone shipping withholds from Detroit and the entire lower peninsula of Michigan the product of mines in Ohio, West Virginia and Kentucky, except when delivery is made for the use of domestic consumers, gas companies, railroads and byproduct plants. This regulation cuts off shipments from the southern fields to industrial and manufacturing plants, and incidentally deprives Detroit jobbers of a large proportion of their trade by taking away their source of supply.

The manufacturing and industrial plants are authorized to provide for their coal requirements by obtaining coal from mines in Indiana and Illinois. Coal from those districts is regarded by many of the local consumers of steam coal as being of an inferior quality. Jobbers report also they are experiencing difficulty in getting coal from Illinois, and that some of the operators in that district appear unable to take care of the new business.

Anthracite—From J. B. Morrow, of the distribution division of the Federal Fuel Administration, Detroit has received assurance that anthracite shipments will be increased at once and that between 80,000 and 90,000 tons will be delivered within the next 30 days. Mr. Morrow also announces Detroit will receive the full 601,000 tons allotted to the city for the coal year. The light shipments so far received are explained as due to the desire to give precedence to movement of coal over the lake routes during the navigation season. The anthracite shipments promised for the month, according to the state fuel administrator, will practically all be required in filling orders already booked from owners of baseburners.

Lake Trade—Lake shipments of bituminous coal are continuing in good volume at an average a little above 1,000,000 tons a week. Vessel capacity for handling the coal is being supplied promptly.

COLUMBUS

With an increased demand for screenings, the coal trade in Ohio is in better shape than a week ago. There is not an oversupply of screenings and mine-run on the market. Lake and domestic tonnage is selling well.

Recent modifications of the embargo against shipping anything except lump coal into Michigan have had the effect of relieving the fine coal situation in Ohio. For several weeks there was an oversupply of screenings, and limits on storage to Ohio consumers were lifted. But the latest modification is to include all of southeastern Michigan in the territory to which screenings can be shipped. As a result there is no oversupply available and the steam market is again about normal. Manufacturing plants are still in the market for a considerable tonnage of fine coal. Public service concerns are well supplied and public institutions are also looked after. Indications point to a steady steam trade for the immediate future.

The domestic trade is also rather active. Dealers are taking time by the forelock, so to speak, and are stocking up for the first cold snap. Retail stocks are fairly large. Some of the dealers are enlarging their storage space in order to be in a better position when the low temperatures arrive. Orders are not plentiful, as fully 75 per cent. of the domestic coal required in central Ohio has been stored by the householder. Retail prices are firm at the levels which have prevailed for some time. Pocahontas is not to be had and there is only a small amount of anthracite available. Pomeroy Bend and the Hocking Valley are supplying the greater part of the domestic tonnage.

Production is slightly increased in most of the Ohio fields, although there is considerable car shortage reported. The lack of cars is most noticeable on the Toledo & Ohio Central and Kanawha & Michigan. Motive power is scarce, and that is the principal reason for failure of empties to arrive at the mines. The Hocking Valley Ry. is now receiving locomotives ordered almost a year ago, and some of the U. S. A. locomotives are diverted to other lines. In eastern Ohio there is still a marked labor shortage which is curtailing the output. Generally speaking, the output is estimated at about 75 per cent. during the past week.

The lake trade is being pushed as rapidly as possible. The vessel movement is active and little time is lost at either end of the journey. Indications point to a complete filling of the requirements of the Northwest before the closing of navigation.

CINCINNATI

Strong demand in all departments. Supply as good as at any recent time, and increasing consumption for heating is noted.

With some raw and cold weather as a further stimulus to consumption in this vicinity, there has been no opportunity for a let-up in the demand for fuel lately, especially in view of the well-advertised conviction of some high authorities that there is not going to be enough coal to go around when the severe weather arrives. With this belief firmly impressed upon the public in general, including the numerous manufacturing concerns which have been unable to secure rating as essential industries, entitling them to a regular supply of fuel under a priority order, it is natural that demand should continue from all quarters at a high rate. Efforts are still being made by manufacturers who have not received priority rating to secure such rating from the authorities at Washington, but there are extremely few instances where such efforts have been successful. The result has been that arrangements for the storage of a larger supply of coal than ever before are being made by these manufacturers, in order to enable them to tide over anticipated periods of shortage without the necessity of suspending operations. Retailers are in the market for about all the coal they can secure, as the cooler weather has produced the usual crop of one-ton orders, and the average dealer is still occupied in making deliveries on orders booked some time ago for fall and winter delivery. The danger of a domestic shortage locally is rapidly diminishing as these deliveries are made, and is not now considered serious.

LOUISVILLE

Domestic coal in better supply, demand little weaker. New regulations allowing stocking of screenings by industrial consumers are aiding situation materially. Operations on much better basis of production.

Lump coal is coming in from the mines in much better quantities than it has, and some of the retailers are again stocking a little surplus of western Kentucky lump, as the demand is not so keen as it has been. All deliveries of eastern Kentucky domestic sizes are being cleaned up as rapidly as received at the present time. The steam demand is generally good, but hasn't been up to production under old regulations.

Wiley B. Bryan, Federal Fuel Administrator for Kentucky, during the week announced that effective at once, the order of Aug. 26, limiting the amount of eastern Kentucky coal stored by public utilities, has been modified as follows: "All restrictions covering the storage of slack and screenings from the eastern Kentucky fields have been withdrawn. This does not apply to the storage of mine-run or prepared sizes of coal from eastern Kentucky, restrictions on which will prevail as cited in the order of Aug. 26. All restrictions are removed covering the storage of coal by industrial or other consumers of all grades of coal mined in western Kentucky." The order of Aug. 26 limited the amount of storage of eastern Kentucky coal by public utilities to a 30-day supply; by preferred industries to 20 days, and non-preferred industries to 15 days. The order permitted the use of only

screenings or mine-run from western Kentucky for current necessities as a condition of retaining reserve stocks of eastern Kentucky coal.

Under the new regulations the operators will be enabled to dispose of all screenings with dispatch. Under the old regulations many of the eastern Kentucky producers had about quit loading out lump coal, as they had no market for screenings. Many had had considerable trouble in disposing of screenings, and preferred shipping nothing but mine-run, which could not be utilized to advantage by retailers unless they had screening facilities.

BIRMINGHAM

Coal trade in this district continues firm. Steam is fairly easy, while domestic demand does not seem to have lost any strength. Production still badly off. Car supply ample in most cases to move all coal mined without delay or interruptions.

The local market, so far as steam grades go, is comparatively easy, some reports indicating a slightly stiffer demand than last week. The production and requirements are perhaps nearer a parity now than before at any time this year. The call for domestic grades has slackened little, if any, and receipts are still inadequate to fill orders in the hands of dealers. Yards have been unable to make any progress in accumulating stock piles for the late buyers who, for one reason or another, are not laying in their winter fuel.

The Alabama field hung up another low-production record for the week ending Sept. 28, only 383,067 net tons being mined for this period. Spanish influenza is invading the mining camps now, and if allowed to spread will seriously cripple operations. It is prevalent in the Walker County field and is already hampering the output in that section. Labor is showing little inclination to speed up, and much time is being lost by mine workers without excuses worthy of consideration. Mines report an adequate car supply in most all instances and there has been no loss of time waiting on loading equipment.

Mines on the Warrior River without rail connection are now being afforded some relief by the wooden barges being used temporarily in moving their coal to the Mobile and New Orleans markets. The steel barges are expected to be in commission in the early part of November and ample service on the river will enable a much larger production from these operations on the river or connected by short rail lines.

Coke

CONNELLSVILLE

Large increase in pig iron output attributed partly to improvement in coke quality, much complaint remaining. Coke production practically unchanged.

The report of pig-iron production in September showed even a larger gain over August than was expected, the rate being about 41,900,000 tons a year, for the whole country, against a rate of only 40,300,000 tons in August. While the progress of the season, bringing lower atmospheric humidity, is credited with part of the improvement, a considerable part is probably attributable to the supply of coke of better quality, a matter to which the Fuel Administration has been giving close attention since the end of August. There are practically no reports of coke shortage, but complaint as to quality is still prevalent.

Production of coke in the Connellsville region shows no great change, but has been decreasing slightly the past few weeks, all in favor of more coal being shipped out of the region, however, as the total of coal coked at home and coal shipped to byproduct ovens has increased almost every week. If more coal from other districts can be found to supply to byproduct ovens it will be possible to resume operations at some beehive ovens in the region recently closed.

Screening operations at old dumps have decreased since the recent reduction in the price limit, but several operations are still actively engaged and there is a fair-sized output of this material, which always finds a ready market as household fuel. The market remains quotable at the set limits: Furnace, $6; foundry, 72-hour selected, $7; screened, over 3-in., $7.30; clean screenings from old dumps, over ½-in., $5.50, all per net ton at ovens.

The "Courier" reports coke production in the Connellsville and Lower Connellsville region in the week ended Oct. 5 at 330,160 tons, a decrease of 5035 tons.

Buffalo—The trade continues strong, the local by-product plants experiencing considerable difficulty in keeping up their output, on account of the influenza epidemic and the street railway strike. Still there is no complaint from the consumers and the requirement is met somehow. Government prices prevail and govern the by-product output also, on the basis of $7 per net ton for foundry and $6 for foundry at the beehive ovens. Fuel coke is active, jobbers selling all they can get at government prices from $4.84 up.

Middle Western

GENERAL REVIEW

Production keeps up and territory finds it difficult to absorb large tonnage. Screenings and steam sizes weak. Railroad administration practically does away with reconsignment of cars.

For the last three weeks or a month there have been no changes to speak of in the Middle West coal market. Production keeps up under very favorable conditions, and the territory is having a difficult time absorbing the large tonnage produced. Screenings and all steam sizes are weak, and will probably continue so for some time. There is a fair demand for the carefully prepared domestic coals, but it is not as strong as it was during July.

The recent ruling of the Fuel Administration, taking 100 cars per day from the Mississippi Valley, and giving them to the West Virginia and eastern coal fields, is going to be felt, and will eventually strengthen the market. Just how much effect this rule will have on the market will depend entirely upon how long Illinois and Indiana are to be deprived of coal cars for the benefit of the eastern producers. To date, however, the coal carrying equipment forwarded east has had no noticeable effect on either the market or the producers.

A factor which has tended to keep the market weak is a ruling by the Railroad Administration which practically does away with reconsigning. This has caused the coal jobber to buy more cautiously. Instead of purchasing a string of cars to be shipped to a given reconsigning point, and taking a chance on disposing of the coal which is in transit, the jobber now is forced to sell his coal before it is shipped. The result is that the tonnage shipped for the account of various jobbers is falling off to a substantial degree.

Developments of the zone question have turned out as expected, and at the present time Illinois coal will be allowed to move to points within the "summer zone" until further notice. The eventual result will no doubt be that the summer zone will remain for all winter, and probably be enlarged as well. The authorities have taken this step, because in spite of large purchases on the part of a number of railroads the market keeps weak.

CHICAGO

Little interest shown in coal. Domestic coals firm, but retailers do not seem to be adding to their storage piles. Anthracite situation getting worse.

There has been no great strengthening in the Chicago market since last week. On the whole, purchasing agents are little interested in coal. One of the large purchasers has withdrawn from the market, but to counterbalance this a big public utility corporation, with plants in the Northwest, has entered the market, and has purchased practically all the screenings available in the southern Illinois district. Domestic coals of the better grade are firm, but there is no noticeable tendency on the part of the retailers to add to their storage piles. The anthracite situation gets worse from day to day, rather than improves.

MILWAUKEE

Mild weather heading off an impending clamor for coal. Complaint of over-deliveries at the expense of small consumers. Labor scarcity hampers shipments.

Mild, Indian summer weather throughout this section of the Middle West serves to allay to some extent the anxiety of consumers as to fuel supplies for the coming winter, but a storm is bound to break when the freezing period finds thousands of bins bare of coal. To offset the plea of dealers that shortage of help is hampering deliveries, the charge is made that 22 homes on a leading residential street contain an aggregate of 710 tons of coal, while many poor cottagers, who have had their orders in for months, have not received a pound. The matter is to be investigated. The fuel administration office is urging dealers to make deliveries in small lots and authorizes them to suggest any changes in present rules which will facilitate such action. Every effort will be made to avert suffering when real cold weather sets in. Lack of yard help is hindering shipments to interior points. One dock which normally loads 1000 cars per month has been unable to send out more than about 400 cars.

The county authorities have received bids on 500 tons of mine-run steam coal for two public institutions, but no award will be made until samples are given a test.

Cargo receipts for October thus far aggregate 33,271 tons of anthracite and 112,403 tons of bituminous, making the latest revision of the season's receipts 494,709 tons of hard and 2,880,080 tons of soft coal.

ST. LOUIS

The local condition is beginning to get serious on account of no market for Standard and Mt. Olive domestic and steam sizes. Carterville more plentiful and certain large dealers have shut off Carterville shipments on account of domestic demand going to pieces. Country demand easy. Equipment more plentiful and transportation good.

The local situation is one that is receiving serious thought from the operating interests. The last week or two newspaper reports stated that there was going to be a plentiful supply of coal, and a larger tonnage than was anticipated has been put in, which has caused the general public, as well as steam users, to hold up their deliveries, with the result that the retail business is practically at a standstill. Little coal is moving to the retail yards other than that for storage. Steam users who are anticipating putting in storage have stopped, with the result that everything has almost come to a standstill and coal is piling up at the mines in the Standard and Mt. Olive districts. In the course of the next week there may be idle days because of no available market.

In the face of this there is a demand for coal from certain points in Iowa, Nebraska and the north, but on account of zone restrictions these places can receive no Illinois coal. The same pertains to some points in the western part of Missouri, where this coal could move.

The local regulation on the distribution of coal is just as drastic with this surplus as if there was a shortage of 50 per cent. and these restrictions and regulations only have a tendency to demoralize the producing end when they interfere with the distribution end.

The country business on Standard and Mt. Olive coal is pretty well shot to pieces, and there is not much in sight unless the severest kind of weather comes along ahead of time. The mines in the Standard field are plugging along now with plenty of equipment because there is no demand for coal, and transportation has shown considerable improvement. Two-thirds of the field would be idle if the railroad tonnage were withdrawn at this time.

The domestic demand from the Mt. Olive field is better than that from the Standard to outside points, chiefly to Chicago and the north, and some little tonnage from this field is moving to Michigan. There are some reports of a tonnage moving into Canada.

Conditions in the Carterville and Duquoin field have changed little. The car supply is short, but better than it has been. The domestic orders in this field are gradually being caught up with at many mines, although there is far from being a surplus of coal; and this is not likely to occur in this field this winter.

The railroad tonnage continues heavy. As a matter of fact it may be greater now than for some time past because domestic conditions are easier. The tonnage of this coal into St. Louis has been better for the last few weeks than for many months past, and many of the larger retailers have asked the operators to hold up shipments.

New restrictions on retail trade are going into effect, such as the placarding of every car of coal, designating the grade of coal it contains, the licensing of weightmasters, and the stamping of all scale tickets with the grade of coal.

Prevailing market per net ton f.o.b. mines is:

	Williamson and Franklin County	Mt. Olive and Staunton	Standard
6-in. lump..	$2.55@2.75	$2.55@2.75	$2.40@2.70
3x6-in. egg..	2.55@2.75	2.55@2.75	2.40@2.70
2x3-in. nut.	2.55@2.75	2.55@2.75	2.40@2.70
Washed:			
No. 1.....	3.05@3.20	3.05@3.20	.....
No. 2.....	3.05@3.20	3.05@3.20	.....
No. 3.....	3.05@3.20	3.05@3.20	.....
Mine Run..	2.35@2.50	2.35@2.50	2.20@2.30
Screenings..	2.17@2.32	2.17@2.32	1.50@1.60

Special preparation on Carterville is 10 cents extra. Williamson & Franklin Co. rate is $1.10. Other fields 95 cents.